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September 1967

Dextran Bibliography
Part A: Patents

on
Production and Use of Native Dextrans, Partially Degraded Dextrans, and Their Derivatives

U. S. DEPT. OF AGRICULTURE
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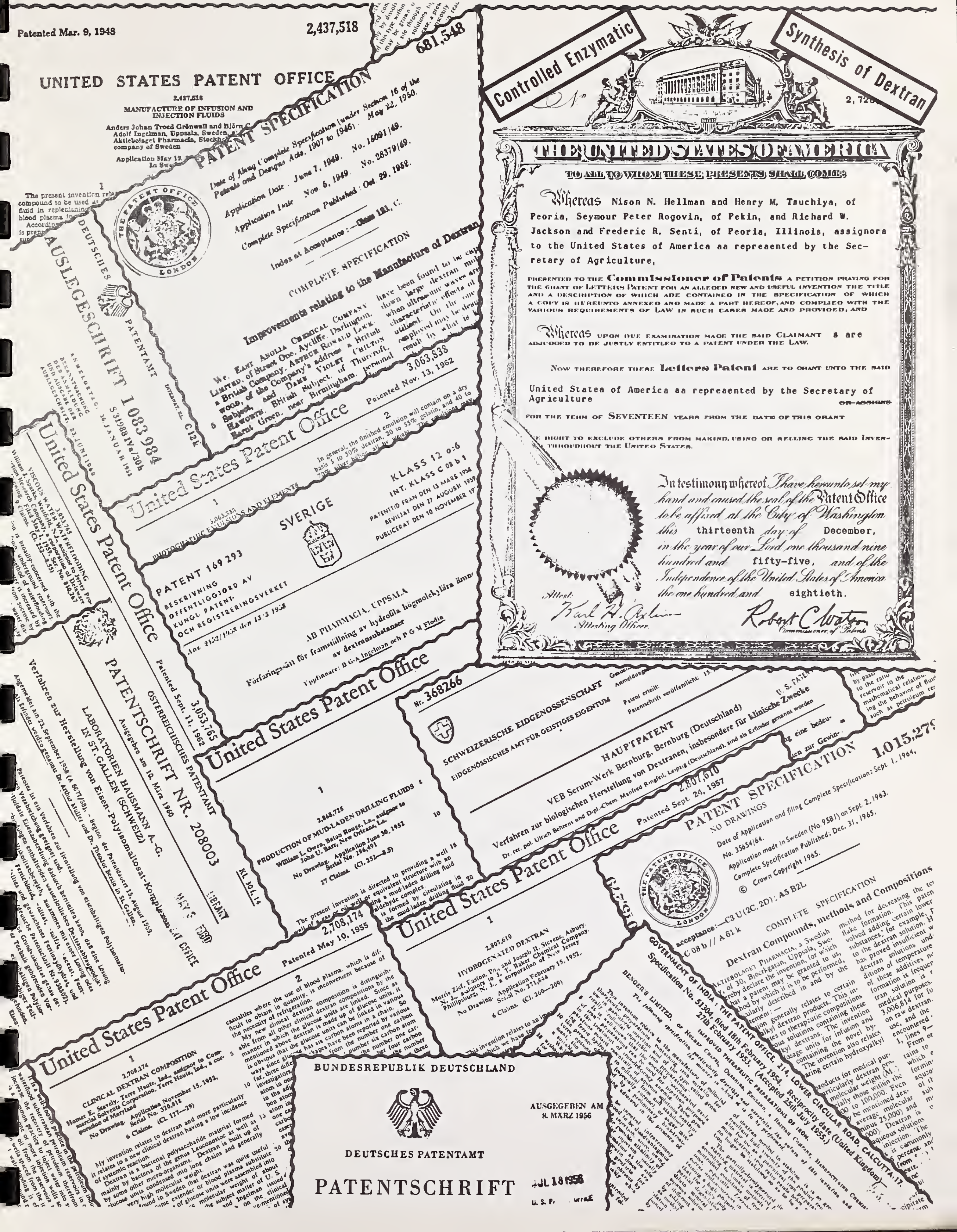
CURRENT SERIAL RECORDS

Agricultural Research Service
United States Department of Agriculture

Controlled Enzymatic Synthesis of Dextran



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Whereas Nison N. Hellman and Henry M. Tsuchiya, of Peoria, Seymour Peter Rogovin, of Pekin, and Richard W. Jackson and Frederic R. Senti, of Peoria, Illinois, assignors to the United States of America as represented by the Secretary of Agriculture,

PRESENTED TO THE **Commissioner of Patents** A PETITION PRAYING FOR THE GRANT OF LETTERS PATENT FOR AN ALLEGED NEW AND USEFUL INVENTION THE TITLE AND A DESCRIPTION OF WHICH ARE CONTAINED IN THE SPECIFICATION OF WHICH A COPY IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND COMPLIED WITH THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED, AND

Whereas UPON DUE EXAMINATION MADE THE SAID CLAIMANT s are ADJUDGED TO BE JUSTLY ENTITLED TO A PATENT UNDER THE LAW.

NOW THEREFORE THESE **Letters Patent** ARE TO GRANT UNTO THE SAID United States of America as represented by the Secretary of Agriculture ~~OR ASSIGNS~~

FOR THE TERM OF SEVENTEEN YEARS FROM THE DATE OF THIS GRANT

THE RIGHT TO EXCLUDE OTHERS FROM MAKING, USING OR SELLING THE SAID INVENTION THROUGHOUT THE UNITED STATES.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington this thirteenth *day of* December, *in the year of our Lord one thousand nine hundred and* fifty-five, *and of the Independence of the United States of America the one hundred and* eightieth.

Attest: Karl H. Axline
Attesting Officer.

Robert C. Watson
Commissioner of Patents.

Patented Mar. 9, 1948 2,437,518

UNITED STATES PATENT OFFICE

2,437,518

MANUFACTURE OF INFUSION AND INJECTION FLUIDS

Anders Johan Troed Grönwall and Björn C. Adolf Ingelman, Uppsala, Sweden, Aktiebolaget Pharmacia, Stockholm, a company of Sweden

Application May 19, ... In Sweden

681,548

PATENT SPECIFICATION

Date of filing Complete Specification (under Section 16 of the Patents and Designs Acts, 1907 to 1946): May 22, 1950.

Application Date: June 7, 1949. No. 16091/49.

Application Date: Nov. 5, 1949. No. 28379/49.

Complete Specification Published: Oct. 29, 1952.

Index at Acceptance:—Class 2(iii), C.

COMPLETE SPECIFICATION

Improvements relating to the Manufacture of Dextran

We, East Anglia Chemical Company Limited, of Street One, Aycliffe, Darlington, a British Company, Arthur Ronald Lack-wood, of the Company's address, a British Subject, and Dame Violet Chilton Haworth, British Subject, of Thurcroft, Barnt Green, near Birmingham, ...

DEUTSCHES PATENTAMT

AUSLEGESCHRIFT 1 083 984

3,063,838

United States Patent Office

Patented Nov. 13, 1962

SVERIGE

PATENT 169 293

BESKRIVNING OFFENTLIGGJORD AV KUNGL. PATENT- OCH REGISTRERINGSVERKET

KLASS 12 o:6

AB PHARMACIA, UPPSALA

Förfaringssätt för framställning av hydrofila högmolekylära ämnen av dextransubstanser

Uppfinnare: B G A Ingelman och P G M Flodin

3,053,765

United States Patent Office

Patented Sept. 11, 1962

VISCOUS WATER-WATERFLOODING

ÖSTERREICHISCHES PATENTAMT

PATENTSCHRIFT NR. 208003

Ausgegeben am 10. März 1960

LABORATORIEN HAUSMANN A.-G. IN ST. GALLEN (SCHWEIZ)

Verfahren zur Herstellung von Eisen-Polyisomaltose-Komplexen

United States Patent Office

2,868,725

PRODUCTION OF MUD-LADEN DRILLING FLUIDS

William L. Owen, Baton Rouge, La., assignor to John U. Barr, New Orleans, La.

No Drawing. Application June 30, 1952, Serial No. 296,491

27 Claims. (Cl. 252—8.5)

SCHWEIZERISCHE EIDGENOSSENSCHAFT

EIDGENÖSSISCHES AMT FÜR GEISTIGES EIGENTUM

Nr. 368266

HAUPTPATENT

VEB Serum-Werk Bernburg, Bernburg (Deutschland)

Verfahren zur biologischen Herstellung von Dextranen, insbesondere für klinische Zwecke

---

2,807,610

United States Patent Office

Patented Sept. 24, 1957

2,807,610

HYDROGENATED DEXTRAN

Morris Zief, Easton, Pa., and Joseph R. Stevens, Asbury, N. J., assignors to J. T. Baker Chemical Company, Phillipsburg, N. J., a corporation of New Jersey

No Drawing. Application February 15, 1952, Serial No. 271,854

6 Claims. (Cl. 260—209)

1,015,279

PATENT SPECIFICATION

NO DRAWINGS

Date of Application and filing Complete Specification: Sept. 2, 1963.

No. 35654/64.

Application made in Sweden (No. 9581) on Sept. 2, 1963.

Complete Specification Published: Dec. 31, 1965.

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Index at acceptance:—C3 U(2C, 2D); A5 B2L

Int. Cl.:—C 08 b // A 61 k

COMPLETE SPECIFICATION

Dextran Compounds, methods and Compositions

GOVERNMENT OF INDIA: THE PATENT OFFICE, 214, LOWER CIRCULAR ROAD, CALCUTTA-17.

Specification No. 51304. Filed 18th February 1954. Reciprocity date (United Kingdom) 27th February 1953. (Accepted 25th July 1955.)

BENGER'S LIMITED

IMPROVED THERAPEUTIC PREPARATIONS OF IRON.

2,708,174

United States Patent Office

Patented May 10, 1955

2,708,174

CLINICAL DEXTRAN COMPOSITION

Homer E. Stavely, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind., a corporation of Maryland

No Drawing. Application November 15, 1952, Serial No. 320,818

6 Claims. (Cl. 127—29)

My invention relates to dextran and more particularly it relates to a new clinical dextran having a low incidence of systemic reaction.

BUNDESREPUBLIK DEUTSCHLAND

AUSGEGEBEN AM 8. MÄRZ 1956

DEUTSCHES PATENTAMT

PATENTSCHRIFT

JUL 18 1956

PREFACE

Investigations on the utilization and chemistry of starch comprise an important part of the research program of the Northern Utilization Research and Development Division, Peoria, Illinois, to develop new and improved uses for the cereal grains.

In 1944, specific studies were initiated on dextran as a source of the disaccharide, isomaltose, one of the constituent structures of starch. This fundamental dextran work formed the basis for an intensive research program begun in 1951 on the development of a blood-plasma volume expander. These dextran investigations were closely coordinated with the programs and recommendations of the National Research Council (Division of Medical Sciences, Subcommittees on Shock and Burns and on Blood and Blood Derivatives); the Bureau of Medicine and Surgery, Department of the Navy; the U. S. Public Health Service, National Institutes of Health; and the Office of Medical Services, Department of Defense.

At the request of the Department of the Army, Office of the Surgeon General, additional fundamental laboratory and engineering studies were conducted on the direct production of clinical dextrans by controlled enzymic synthesis and by selected growing-culture fermentations.

As research studies on dextran progressed, a collection of records and reprints was made. This bibliography of patents is a part of that collection. Sources drawn upon have been the current scientific literature over a period of 20 years, "Chemical Abstracts," and "Uniterm Index to Chemical Patents." The coverage of U.S. patents is essentially complete through December 1966; that of foreign patents is less so because of inaccessibility of sources.

Acknowledgments: Ted Lefco, Patent Advisor at the Northern Utilization Research and Development Division, provided a record of the dextran patents granted periodically in the U.S. from his regular searching of the "Official Gazette" of the U.S. Patent Office. The Patent Department, Corn Products Company, Argo, Illinois, made available from its private files the references and abstracts to approximately 250 of the foreign patents included. References to a number of other patents were provided by Aktiebolaget Pharmacia.

Aktiebolaget Pharmacia, Uppsala, Sweden, expedited completion of this bibliographic publication through encouragement and provision of professional assistance.

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This bibliography extends and supersedes one originally issued as AIC-288, entitled "Dextran -- A Selected Bibliography," October 1950 and revised June 1952 to include "Chemical, Microbiological, Clinical, and Related Publications of Interest in the Use of Dextran as a Synthetic Blood Volume Expander."

Prepared by

Northern Utilization Research and Development Division
Peoria, Illinois 61604

DEXTRAN BIBLIOGRAPHY

PART A: PATENTS[1]

ON PRODUCTION AND USE OF NATIVE DEXTRANS, PARTIALLY DEGRADED DEXTRANS, AND THEIR DERIVATIVES

By Allene Jeanes[2]

with the professional assistance of Bengt Norrman[3]

CHARACTERISTICS OF DEXTRANS UNDERLYING INDUSTRIAL DEVELOPMENT

Dextrans have the distinction of being the first polysaccharides of microbial origin to be produced and utilized industrially. The large number of patents on dextrans and their derivatives issued since 1940 in the 26 countries recorded here attests to worldwide interest. A number of characteristics of dextrans provide the basis for this development. These characteristics include advantageous constitution, ease of production, suitability for a wide range of applications, and nature and variety of derivatives.

Advantageous Constitution

Dextrans are macromolecular polymers composed almost exclusively of the monomeric unit α-D-glucopyranose linked mainly by 1,6-bonds. Variation in the identity, proportions, and distribution within the polymolecule of the non-1,6-glucosidic linkages (1,2-, 1,3-, and 1,4-), and presumably in the manner of branching, results in homologues that may differ widely in physical and biochemical characteristics and that may be peculiarly suited to specific applications. Dextrans that have a large proportion of 1,6-linked units show high solubility in water, and their aqueous solutions are non-retrograding and have excellent stability to hydrolytic degradation. Certain dextrans with smaller proportions of 1,6-linked units are water-insoluble. The structural details of a dextran are determined by the strain of bacteria that produces it.

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[1] The second part of this bibliography, when issued as "Dextran Bibliography Part B," will cover general literature references on microbiology; enzymology; preparation of native and partially degraded dextrans; chemical, physicochemical, biochemical, immunochemical, and serological properties of native and partially degraded dextrans; analytical methods; structure; di- and oligosaccharides from dextrans; derivatives; physiological properties in relation to structure; representative medical applications; industrial aspects and applications; and related subjects.

[2] Research Chemist, Northern Utilization Research and Development Division, Agricultural Research Service, U.S. Department of Agriculture, Peoria, Illinois.

[3] Chemist, Research Division, Aktiebolaget Pharmacia, Uppsala, Sweden. Acknowledgment is made of the sponsorship of AB Pharmacia, under a memorandum of understanding, that made it possible for Mr. Norrman to contribute to the compilation of this bibliography as a special appointee to the Northern Utilization Research and Development Division.

Ease of Production

Dextrans are produced from sucrose by dextransucrase, the extracellularly functioning enzyme (or enzyme system) of *Leuconostoc mesenteroides* and certain related members of the family *Lactobacillaceae*. The polysaccharide may be synthesized in growing cultures of the bacteria or by preformed enzyme utilized as cell-free culture filtrates or as partially purified enzyme concentrates. Synthesis by preformed enzyme permits close control of conditions and, thereby, permits products of selected molecular size range and of more uniform size distribution than are possible by the growing-culture technique.

Suitability for a Wide Range of Applications

The initial patents on dextrans described not only their use in the food industry and as water-loss inhibitors in oil-well drilling muds, but also the formation of ether derivatives. Major activity in the dextran field, however, was initiated by the discovery in Sweden, about 1942-1943, that a safe, effective blood plasma substitute could be made from dextran. Methods new in industrial practice were established for producing native dextran, partially degrading it, and then fractionating to obtain products in the clinical or other size ranges. These developments made available, for the first time, types of polysaccharide materials that were suitable for therapeutical and other pharmaceutical products, as well as for numerous applications in other industries.

Nature and Variety of Derivatives

Dextrans have an average of three alcoholic hydroxyl groups per glucose residue that may undergo either partial or complete etherification or esterification, or complex formation. These derivatives may be neutral, cationic, or anionic; hydrophilic or hydrophobic; and they may show stabilities, interactions, and compatibilities different from those of the unsubstituted dextrans.

CLASSIFICATION OF PATENTS

The patent references are classified in nine sections according to the subject content of major import and emphasis. Some patents, however, contain information bearing on more than one category. When the novelty or extent of information justifies including a patent in more than one classification, the identifying number of the patent in the bibliography is listed at the end of other applicable sections as a cross reference.

The patent bibliography is organized as follows:

- I. Production of native dextrans in growing cultures
    - A. Media and conditions used in production of dextrans, and methods for recovery or isolation of dextrans
    - B. Byproducts of the fermentation and methods for their recovery
- II. Enzymic synthesis of native and clinical-size dextrans
    - A. Production of enzyme-containing solutions and of the enzymes dextransucrase and dextran-dextrinase
    - B. Use of these enzymes to accomplish synthesis of dextrans and related substances, and means for controlling the molecular size of the main synthesis product
    - C. Recovery of byproducts from the synthesis liquors
- III. Degradation of dextrans by dextranases
    - A. Production of dextranases
    - B. Use of dextranases to prepare clinical-size and other partially degraded dextran products
- IV. Other methods for production of dextrans in clinical, intermediate, and low molecular-size ranges
    - A. Chemical and physical methods for partial degradation of native dextrans
    - B. Controlled fermentation conditions as a means for producing dextran products within a desired molecular-size range
    - C. Procedures for fractionating mixtures resulting from partial degradation of dextrans
- V. Special procedures for purifying and stabilizing clinical dextrans and their solutions
    - A. Oxidative depolymerization of native dextrans and concomitant destruction of pyrogens
    - B. Partial depolymerization by alcoholysis with formation of dextran glycosides

   - C. Stabilization of pH during sterilization by heat
   - D. Stabilization of solutions to chemical and physical changes under unfavorable storage conditions by reduction of reducing end-groups, partial etherification, or inclusion of aggregation inhibitors

VI. Industrial uses of dextrans

   - A. For native and partially degraded dextrans and fractions of these
   - B. For compositions containing dextrans

VII. Food uses of dextrans and their derivatives

   - A. As constituents of foods or in processing and stabilizing foods
   - B. As enhancers of food preparations

VIII. Pharmaceutical applications of dextrans and their derivatives

   - A. Dextran derivatives, dextrans, and dextran-containing compositions, often restricted as to range of molecular weight
   - B. Dextran sulfates as anticoagulants
   - C. Dextran-metal complexes, especially production of the complex (or compound) of dextran and ferric ion used in treatment of iron-deficiency anemia in humans and other animals
   - D. Use in cosmetics, dentifrices, hair preparations, and skin ointments and powders, as well as in contrast compositions for X-ray and other diagnostic examinations
   - E. Use of crosslinked dextran gels in the production of enzymes and other biological preparations
   - F. Dextran named as one of numerous polysaccharide materials that meet the patent claims

IX. Production and industrial uses of dextran derivatives

   - A. Primary emphasis on dextran derivatives, but sometimes details of dextran production given also
   - B. Dextran named among various polysaccharides derivatized

BIBLIOGRAPHY OF PATENTS

Order of Arrangement and Definitions

- The primary order of arrangement within each class is alphabetical according to the name of the first patentee; the secondary order is chronological. Patents are numbered consecutively throughout.
- The name of the patent assignee appears in brackets after the name of the patentee(s). Because of the length of the name of two assignees and the frequency of occurrence, symbols are used as follows:
  [Assignee A] designates the United States of America as represented by the Secretary of Agriculture.
  [Assignee B] designates the Commonwealth Engineering Company of Ohio.
- Titles of all foreign patents have been translated into English. The original language in which the patent was issued is evident from the name of the country that precedes the patent number.
- The date usually given is when the final patent was granted. Exceptions are for:
  Applications (Appln.)--A few applications are included for Belgium, Denmark, Germany, Netherlands, New Zealand, and Sweden. The date of publication is given.
  For Austria, "A" is prefixed to the application number.
  Specifications (Spec.)--For South Africa, some specifications are included with the date of acceptance.
  Publications--For Germany, Deutsche Auslegeschriften (DAS) are published for opposition; the date given designates when this was done. For Japan, all patents included bear the publication number and the publication date.
- Supplementary reference to "Chemical Abstracts" is cited for two groups of patents, that is:
  Those from countries where languages less generally understood are used (Czechoslovakia, Hungary, Japan, Poland, and U.S.S.R.).
  Those drawn from "Chemical Abstracts" which have not been verified in the original.
- Patents not examined in either the original or in "Chemical Abstracts" are marked by an asterisk. All other patents have been examined in the original.
- Cross references are listed at the end of each section.

I. PRODUCTION OF NATIVE DEXTRANS IN GROWING CULTURES

AMERICAN SUGAR REFINING CO. 1
Production and Fractionation of Dextrans. Britain 716,660. Oct. 13, 1954.

BEHRENS, U., GABERT, A., and RINGPFEIL, M. 2
Process for Separating Polysaccharides and Their Derivatives From Solutions. East Germany 34,912. Jan. 15, 1965.

__________ GABERT, A., and RINGPFEIL, M. [Deutsche Akademie der Wissenschaften zu Berlin] 3
Process for the Separation of Dextran and Carboxymethyl Dextran from Solutions. Germany (DAS) 1,203,700. Oct. 21, 1965.

COMMONWEALTH ENGINEERING CO. OF OHIO 4
Process Permitting Isolation of Dextran Practically Free of Fermentation Nutrients. Belgium 554,923. May 31, 1957.

THE DOW CHEMICAL CO. 5
Separation of Dextran from Fructose Using Ion Exchange Resins. Belgium 661,918. Oct. 1, 1965.*

EAST ANGLIA CHEMICAL CO. LTD., LOCKWOOD, A.R., and SWIFT, G. 6
Improvements in and Relating to the Production of Dextran. Britain 634,129. May 28, 1948.

________ 7
Improvements in and Relating to the Production of Dextran. South Africa (Spec.) 1963/48. Accepted Feb. 10, 1949.

HAWORTH, W.N., and STACEY, M. 8
Improvements in and Relating to the Production of Dextran From Sucrose by Means of Dextran-Forming Bacteria. Britain 618,999. March 2, 1949.

HEHRE, E.J., TSUCHIYA, H.M., HELLMAN, N.N., and SENTI, F.R. [Assignee A] 9
Production of Dextran. U.S. 2,906,669. Sept. 29, 1959.

JAMES, A.E. [Dextran Ltd.] 10
Production of Dextran. Canada 520,284. Jan. 3, 1956.

KOOI, E.R. [Corn Products Refining Co.] 11
Process for Producing Dextran. U.S. 2,689,816. Sept. 21, 1954.

LIPPS JR., B.J. [Esso Production Research Co.] 12
Fermentation Process for Preparing Polysaccharides. U.S. 3,251,749. May 17, 1966.

__________ [Esso Production Research Co.] 13
Fermentation Process for Producing a Heteropolysaccharide.
U.S. 3,281,329. Oct. 25, 1966.

MÁLEK, J., and LACKO, L. 14
Dextran. Czechoslovakia 96,077. July 15, 1960. (Chem. Abstr.
58:7338c. 1963.)

__________ and LACKO, L. 15
Recovery of Dextran. Czechoslovakia 96,416. Aug. 15, 1960.
(Chem. Abstr. 58:7338e. 1963.)

NOVAK, L.J., and STOYCOS, G.S. [Assignee B] 16
Method for Isolating Substantially Free Dextran From Fermentates
Comprising the Same. U.S. 2,798,065. July 2, 1957.

__________ and STOYCOS, G. [Assignee B] 17
Method of Isolating Substantially Free Dextran From Food Fermentate.
Canada 579,193. July 7, 1959.

ÖPPINGER, H., and OPPERMANN, A. [Farbwerke Hoechst Akt.-Ges.] 18
Process for Preparation of Dextran. Germany 1,003,397.
April 2, 1959.

OWEN JR., W.L., and OWEN, W.L. 19
Production of Gum Dextran. U.S. 2,392,258. Jan. 1, 1946.

SARGENT, R.N. [The Dow Chemical Co.] 20
Separation of Dextran From Fructose Using Ion Exchange Resins.
U.S. 3,184,334. May 18, 1965.

STAHLY, G.L. [Assignee B] 21
Method of Making Dextran. U.S. 2,310,263. Feb. 9, 1943.

STOYCOS, G., and NOVAK, L.J. [Assignee B] 22
Method of Isolating Substantially Pure Dextran From Fermentation Products and the Degradation Thereof. Britain 800,288. Aug. 20, 1958.

VANECEK, R. 23
A Method of Producing Mannite. Czechoslovakia 102,742. Feb. 15, 1962.*

WERTHER, HANNA, WERTHER, H.D., MULLER, P, BEHRENS, U., RINGPFEIL, M., GABERT, A., KRUGER, K., TOPORSKI, W., HEYNE, B., KLIPP, W., and GILLE, H. 24
Process and Device for Precipitating Fermentation Products, in Particular Dextran, From a Fermentation Solution. East Germany 31,904. March 5, 1965.*

WIMMER, E.L. [American Sugar Refining Co.] 25
Fractionation of Dextrans With Alkaline Earth Hydroxides. U.S. 2,685,579. Aug. 3, 1954.

__________ [American Sugar Refining Co.] 26
Isolation of Dextran by Alkaline Earth Hydroxide Complex Formation and Products Thereof. U.S. 2,686,777. Aug. 17, 1954.

__________ and LAKATA, G.D. [American Sugar Refining Co.] 27
Dextran Production. U.S. 2,775,540. Dec. 25, 1956.

__________ [American Sugar Refining Co.] 28
Process for Purifying and Fractionating Dextran. Germany 966,852. Sept. 12, 1957.

YAMANAKA, S. [Chiyoda Chemical Industry Co.] 29
A Method for the Preparation of Dextran. Japan 17,397/61. Sept. 26, 1961. (Chem. Abstr. 56:14745d. 1962.)

Cross References: 31, 32, 40, 47, 48, 96, 100, 217, 349, 541, 671-673, 700.

II. ENZYMIC SYNTHESIS OF NATIVE AND CLINICAL-SIZE DEXTRANS

BEHRENS, U. 30
Clinical Dextran. U.S.S.R. 121,908. Oct. 16, 1959.*

__________ and RINGPFEIL, M. [VEB Serum-Werk Bernburg] 31
Process for the Production of Low Molecular Dextran, in Particular of Starter for Controlled Synthesis.
Germany (DAS) 1,083,021. June 9, 1960.

__________ and RINGPFEIL, M. [VEB Serum-Werk Bernburg] 32
Process for Enzymatic Synthesis of Dextran.
U.S. 3,044,940. July 17, 1962.

GILKISON, J.S., and KOOI, E.R. [Corn Products Refining Co.] 33
Recovery and Purification of Enzymes. U.S. 2,810,677.
Oct. 22, 1957.

HELLMAN, N.N., TSUCHIYA, H.M., ROGOVIN, S.P., JACKSON, R.W.,
and SENTI, F.R. [Assignee A] 34
Controlled Enzymatic Synthesis of Dextran.
U.S. 2,726,985. Dec. 13, 1955.

KOEPSELL, H.J., JACKSON, R.W., and HOFFMAN, C.A. [Assignee A] 35
Production of Fructose. U.S. 2,729,587. Jan. 3, 1956.

__________, KAZENKO, ANNA, JEANES, ALLENE R., SHARPE, E.S.,
and WILHAM, C.A. [Assignee A]
Preparation and Use of Polysaccharide-Producing Enzyme.
U.S. 2,673,828. March 30, 1954.

KOOI, E.R. [Corn Products Refining Co.] 37
Process of Producing Dextran. U.S. 2,801,204. July 30, 1957.

__________ [Corn Products Refining Co.] 38
Process of Producing Dextran. U.S. 2,801,205. July 30, 1957.

__________ [Corn Products Refining Co.] 39
Production of Dextran-Dextrinase. U.S. 2,833,695. May 6, 1958.

NEELY, W.B. [The Dow Chemical Co.] 40
Control of Calcium to Increase Dextransucrase. U.S. 2,961,379. Nov. 22, 1960.

__________ [The Dow Chemical Co.] 41
Process for Modifying Polysaccharides and Products Thereof. U.S. 3,133,856. May 19, 1964.

PATAT, F. [Farbwerke Hoechst Akt.-Ges.] 42
Process for Manufacturing Native Dextran. Germany 1,089,711. March 30, 1961.

SHURTER, R.A. [Commercial Solvents Corp.] 43
Continuous Dialysis Process for Production of Clinical Dextran. U.S. 2,717,853. Sept. 13, 1955.

SJÖSTRÖM, C.G.E. [Svenska Sockerfabriks Aktiebolaget] 44
Process for the Enzymatic Production of Dextran From Saccharose. Canada 531,909. Oct. 16, 1956.

__________ [Svenska Sockerfabriks Aktiebolaget] 45
Crude Dextran for Pharmaceuticals From Sucrose. Sweden 157,635. Jan. 29, 1957. (Chem. Abstr. 52:666i. 1958.)

__________ 46
Process for Obtaining Dextransucrase. Germany 1,083,984.
Dec. 15, 1960.

STOYCOS, G.S. [Assignee B] 47
Buffering of Dextran Fermentations. U.S. 2,694,670.
Nov. 16, 1954.

__________ [Assignee B] 48
Buffering of Dextran Fermentations. Canada 536,756.
Feb. 5, 1957.

SVENSKA SOCKERFABRIKS AKTIEBOLAGET 49
Enzymatic Process for Producing Dextrane From Saccharose.
Belgium 517,343. Feb. 2, 1953.

__________ 50
A Process for the Enzymatic Production of Dextran From Saccharose.
South Africa (Spec.) 371/53. Accepted April 4, 1953.

__________ 51
Enzymatic Production of Dextran From Saccharose.
Britain 734,369. July 27, 1955.

__________ 52
Process in the Enzymatic Preparation of Dextran. Denmark 92,957.
March 12, 1962.

TSUCHIYA, H.M., and KOEPSELL, H.J. [Assignee A] 53
Production of Dextransucrase. U.S. 2,686,147. Aug. 10, 1954.

__________, HELLMAN, N.N., and KOEPSELL, H.J. [Assignee A] 54
Synthesis of Dextran and Dextran Analogs of Predetermined
Molecular Weight. U.S. 2,724,679. Nov. 22, 1955.

Cross References: 23, 97-99, 143, 263, 408, 411, 566, 587.

III. DEGRADATION OF DEXTRANS BY DEXTRANASES

AKTIEBOLAGET PHARMACIA 55
Process for Producing Dextran Products for Pharmaceutical and Therapeutical Preparations. India 42,252. Feb. 22, 1950.

________ 56
Process for Manufacturing Dextrane Products for the Preparation of Pharmaceutical and Therapeutical Products. Argentina 75,248. March 28, 1950.*

________ 57
Process for Producing Dextran Products for Pharmaceutical and Therapeutical Preparations. Britain 675,025. July 2, 1952.

________ 58
Process for Producing Dextran Degradation Products. Denmark 77,987. Aug. 23, 1954.

CARLSON, VIRGINIA W., and CARLSON, W.W. [Enzymatic Chemicals Inc.] 59
Method of Producing Dextran Material by Bacteriological and Enzymatic Action. U.S. 2,709,150. May 24, 1955.

________ [Assignee B] 60
Process for Producing Dextran of Suitable Molecular Weight. Mexico 56,683. May 16, 1956.

CARLSON, W.W., and WHITESIDE-CARLSON, V. [Assignee B] 61
Process for Obtaining Dextranase. Germany 1,033,167. Dec. 18, 1958.

CARLSON, VIRGINIA W., and CARLSON, W.W. [Assignee B] 62
Method of Producing a Dextran Splitting Enzyme. Canada 581,950 Aug. 25, 1959.

CARLSON, W.W., and WHITESIDE-CARLSON, V. [Assignee B] 63
Way of Making Dextran of Relatively Low Molecular Weight From Dextran of Relatively High Molecular Weight by Use of Dextranase. Sweden 177,853. Jan. 16, 1962.

COMMONWEALTH ENGINEERING CO. OF OHIO 64
Method of Producing Carbohydrate Material by Bacteriological and Enzymatic Action. South Africa (Spec.) 959/52. Accepted July 22, 1952.*

__________ 65
Degradation of Dextran. Britain 721,484. Jan. 5, 1955.

__________ 66
Production of a Dextran-Splitting Enzyme by the Cultivation of *Aspergillus wentii*. Britain 767,671. Feb. 6, 1957.*

__________ 67
A Process for the Preparation of a Limit Dextranase. Netherlands (Appln.) 170,353. Sept. 15, 1958.*

__________ 68
Process of Preparing Endo-Dextranase and Dextran by Use of This Endo-Dextranase. France (DPA) 1,179,219. May 21, 1959.

CORMAN, J., and TSUCHIYA, H.M. [Assignee A] 69
Enzymic Production of Dextran of Intermediate Molecular Weights. U.S. 2,776,925. Jan. 8, 1957.

GRÖNWALL, A.J.T., and INGELMAN, B.G.A. [Aktiebolaget Pharmacia] 70
Process for the Manufacture of Dextran Degradation Products for Medical Purposes. Germany 837,007. April 17, 1952.

HULTIN, E., and NORDSTRÖM, L. 71
Way of Making an Enzyme That Has Ability to Degrade Dextran Polysaccharide and Use of Such Enzyme to Make Smaller Dextran Molecules. Sweden 133,157. Oct. 9, 1951.

NOVAK, L.J., and STOYCOS, G.S. [Assignee B] 72
Method for Producing Clinical Dextran. U.S. 2,841,578. July 1, 1958.

__________ and WITT, E.E. [Assignee B] 73
Method of Producing Clinical Dextran. U.S. 2,972,567. Feb. 21, 1961.

__________ and WITT, E.E. [Assignee B] 74
Dextran and Method of Producing Same. Britain 910,736. Nov. 21, 1962.

__________ and WITT, E.E. [Assignee B] 75
Dextran and Method of Producing Same. Canada 653,066. Nov. 27, 1962.

POVIET PRODUCTEN N.V. 76
Process for the Manufacture of Products From Dextran for Pharmaceutical and Therapeutic Products. Belgium (Appln.) 491,665. Oct. 14, 1949.*

__________ 77
Process for Preparation of Dextran Products for Pharmaceutical and Therapeutic Products. Netherlands 76,385. Nov. 15, 1954.

TSUCHIYA, H.M., JEANES, ALLENE, BRICKER, HELEN M., and WILHAM, C.A.
[Assignee A] 78
Production of Dextranase. U.S. 2,742,399. April 17, 1956.

WHITESIDE-CARLSON, VIRGINIA, and CARLSON, W.W. [Assignee B] 79
Production of Endo-Dextranase by *Aspergillus wentii*. U.S. 2,716,084. Aug. 23, 1955.

__________ and CARLSON, W.W. [Assignee B] 80
Production of Endo-Dextranase by Aspergillus wentii.
U.S. 2,716,237. Aug. 23, 1955.

__________ and CARLSON, W.W. [Assignee B] 81
Production of Endo-Dextranase by Aspergillus wentii.
Canada 529,893. Sept. 4, 1956.

__________ and CARLSON, W.W. [Assignee B] 82
Production of Endo-Dextranase by an Aspergillus Mold.
Britain 775,948. May 29, 1957.

__________ and CARLSON, W.W. [Assignee B] 83
Process for the Enzymatic Degradation of Dextran.
Germany (DAS) 1,052,639. March 12, 1959.*

__________ and CARLSON, W.W. [Assignee B] 84
Method of Producing Carbohydrate Materials by Bacteriological and Enzymatic Action. Canada 588,122. Dec. 1, 1959.

Cross References: 169, 183, 571, 636, 637, 658-660.

IV. OTHER METHODS FOR PRODUCTION OF DEXTRANS IN THE CLINICAL, INTERMEDIATE, AND LOW MOLECULAR-SIZE RANGES

AKTIEBOLAGET PHARMACIA 85
Improvements in or Relating to the Degradation of Dextrane.
Britain 583,378. Dec. 17, 1946.

__________ 86
Process for Producing Polymer Homologues of Polysaccharides.
Denmark 67,180. July 12, 1948.

__________ 87
Improvements in or Relating to the Degradation of Dextrane.
India 40,613. May 19, 1949.

———— 88
Process for Manufacturing Dextrane Products for Pharmaceutical
and Therapeutical Preparations. Argentina 75,276. March 29, 1950.

———— 89
Process for Producing Molecularly More Uniform Dextran Products
for Pharmaceutical and Therapeutical Preparations.
South Africa 8,817. April 3, 1950.

———— 90
Process for Producing Dextran Products for Pharmaceutical
and Therapeutic Preparations. Argentina 76,991. Aug. 18, 1950.*

———— 91
Process for Producing Molecularly More Uniform Dextran Products
for Pharmaceutical and Therapeutical Preparations. India 42,253.
Aug. 22, 1950.

———— 92
Process for the Production of Dextran Degradation Products
for Pharmaceutical and Therapeutic Preparations.
Germany (Appln.) 3,384. July 26, 1951.

———— 93
A Process for Treating Dextran for Use in Pharmaceutical and
Therapeutic Preparations. Britain 673,103. June 4, 1952.

———— 94
Process for Producing Dextran Products for Pharmaceutical
and Therapeutical Preparations. Britain 675,085. July 2, 1952.

———— 95
Process for Producing Polymer Homologues of Partially
Depolymerized Dextran. Denmark 77,579. May 31, 1954.

BEHRENS, U., and RINGPFEIL, M. 96
Method for the Production of Polysaccharides, Particularly
of Dextran for Clinical Purposes. East Germany 19,254.
July 14. 1960.*

__________ and RINGPFEIL, M. [VEB Serum-Werk Bernburg] 97
A Process for the Preparation of Polysaccharides by Synthesis.
France (DPA) 1,261,871. April 17, 1961.

__________ and RINGPFEIL, M. 98
Method for the Production of Low Molecular Dextrans With
Molecular Weight Smaller Than 60,000, Particularly of
Starters for Controlled Synthesis. East Germany 21,324.
May 23, 1961.

__________ and RINGPFEIL, M. [VEB Serum-Werk Bernburg] 99
Process for Biological Production of Dextran, Especially
for Clinical Purposes. Switzerland 368,266. May 15, 1963.

__________ and RINGPFEIL, M. [VEB Serum-Werk Bernburg] 100
Process for the Production of Polysaccharides by a Biological
Synthesis, Expecially of Dextran With Clinical Properties.
Germany 1,083,020. April 1, 1965.

__________, RINGPFEIL, M., GABERT, A., and KRÜGER, K. 101
Process for the Semi Continuous Production of Dextran.
East Germany 35,367. March 5, 1965. (Chem. Abstr. 63:7624e. 1965.)

__________, RINGPFEIL, M., GABERT, A., and KRÜGER, K.
[VEB Serum-Werk Bernburg] 102
Process for the Preparation of Polysaccharides, Especially
Dextran, Through Controlled Microbiological Synthesis by
Means of Primer-free Inoculum. East Germany 35,899.
April 26, 1965. Addition to East Germany 19,254.

BELLAMY, W.D. [General Electric Co.] 103
Process for Production of Dextran. Germany 958,423.
Jan. 31, 1957.

__________ [General Electric Co.] 104
Depolymerization of High Molecular Weight Dextran.
U.S. 2,867,571. Jan. 6, 1959.

COMMERCIAL SOLVENTS CORP. 105
Improvements in or Relating to Process for Preparing Dextran and the Dextran Resulting From Said Process. South Africa 19,310. May 17, 1954.

________ 106
Process for Preparing Dextran. Argentina 94,244. July 5, 1954.*

________ 107
Improvements in or Relating to Process for Preparing Dextran and Dextran Resulting From Said Process. Australia 165,029. Sept. 5, 1955.

________ 108
Improvements in or Relating to the Preparation of Dextran and Therapeutic Infusion Fluids. Britain 772,535. April 17, 1957.*

________ 109
An Improved Process for the Preparation of Dextran. France (DPA) 1,273,351. Sept. 4, 1961.

COMMONWEALTH ENGINEERING CO. OF OHIO 110
Process for Hydrolysis of Dextran. Belgium 554,243. May 15, 1957.

DALTER, R.S. [Commercial Solvents Corp.] 111
Process for Hydrolyzing Dextran. U.S. 2,727,838. Dec. 20, 1955.

DEXTRAN LIMITED 112
Improvements Relative to the Degradation of Dextran. Belgium 510,036. March 18, 1952.

________ 113
Improvements Relating to the Degradation of Dextran. South Africa (Spec.) 583/52. Accepted June 3, 1952.*

——— 114
Process for Degrading Dextran. Argentina 86,604. Oct. 23, 1952.*

——— 115
Improvements Relating to the Degradation of Dextran.
South Africa 15,275. Jan. 5, 1953.

——— 116
Improvements Relating to the Degradation of Dextran. India 46,062.
April 20, 1953.

——— 117
Process for Partially Depolymerizing Dextran. Denmark 76,449.
Oct. 5, 1953.

——— 118
Process for Preparing a Substitute for Blood Plasma, Consisting
of Depolymerized Dextran. Netherlands 77,200. Feb. 15, 1955.

——— 119
Process for Preparing a Dextran Suitable for Use in Therapeutical
Liquids Also Process for Preparing Therapeutical Liquids
Containing Such a Dextran. Netherlands (Appln.) 168,162.
July 16, 1956.*

——— 120
A Process for the Thermic Decomposition of Dextran.
Denmark 93,839. July 9, 1962.*

DRECHSLER, M., and TOPORSKI, W. 121
Method for the Production of Low Molecular Dextran With Starter
Qualities. East Germany 23,189. May 21, 1962.

EAST ANGLIA CHEMICAL CO. LTD. 122
Improvements in and Relating to the Degradation of Dextran.
South Africa 6312. June 10, 1949.

________ 123
Improvements in and Relating to the Degradation of Dextran.
India 40,017. June 10, 1949.

________ 124
Improvements Relating to the Manufacture of Dextran.
South Africa (Spec.) 1222. Accepted July 12, 1950.*

________ 125
A Method of Partially Depolymerising Dextran. India 43,267.
May 25, 1951.

________ 126
Process for the Production of Dextran Depolymerizates.
Germany (Appln.) 1259. July 10, 1952.*

________ LOCKWOOD, A.R., and HAWORTH, DAME VIOLET C. 127
Improvements Relating to the Manufacture of Dextran.
Britain 681,548. Oct. 29, 1952.

FORD, M.D., and NOVAK, L.J. [Assignee B] 128
Acid Hydrolysis of Dextran in Presence of Activated Charcoal.
U.S. 2,787,562. April 2, 1957.

GENERAL ELECTRIC CO. 129
Improvements Relating to the Depolymerization of High Molecular
Weight Dextran. Britain 764,547. Dec. 28, 1956.

GRÖNWALL, A.J.T., and INGELMAN, B.G.A. [Aktiebolaget Pharmacia] 130
Manufacture of Infusion and Injection Fluids. U.S. 2,437,518.
March 9, 1948.

________ and INGELMAN, B.G.A. [Aktiebolaget Pharmacia] 131
Process for Producing Dextran Products Having Substantially
Uniform Molecular Size for Pharmaceutical and Therapeutic
Preparations. U.S. 2,644,815. July 7, 1953.

__________ and INGELMAN, B.G.A. [Aktiebolaget Pharmacia] 132
Process for Producing Dextran Products Having Substantially Uniform Molecular Size for Pharmaceutical and Therapeutical Preparations. Canada 502,836. May 25, 1954.

__________ and INGELMAN, B.G.A. [Aktiebolaget Pharmacia] 133
Process for Manufacture of Dextran Products for Pharmaceutical and Therapeutical Preparations. Germany 916,848. Aug. 19, 1954.

__________ and INGELMAN, B.G.A. [Aktiebolaget Pharmacia] 134
Dextran Injection Fluids. Canada 506,063. Sept. 28, 1954.

__________ and INGELMAN, B.G.A. [Aktiebolaget Pharmacia] 135
Process for Manufacture of Polymer Homologues of Dextran. Germany 918,532. Sept. 30, 1954.

__________ and INGELMAN, B.G.A. [Aktiebolaget Pharmacia] 136
Process for Manufacture of an Aqueous Injection Solution Designed as a Plasma Substitute. Germany 919,365. Oct. 21, 1954.

__________ and INGELMAN, B.G.A. [Aktiebolaget Pharmacia] 137
Process for Producing Dextran Products for Pharmaceutical and Therapeutical Preparations. Canada 520,216. Jan. 3, 1956.

GUDE, M., and SCHULTZE, H.E. [Behringwerke Akt.-Ges.] 138
Process for Production of Infusion Preparations for Augmenting Circulation. Germany 940,059. March 8, 1956.

HINK JR., J.H., and JOHNSON, F.F. [Cutter Laboratories] 139
Method of Drying Heat-Sensitive Biologically Active Substances. U.S. 2,731,731. Jan. 24, 1956.

JAMES, A.E. [Dextran Ltd.] 140
Dextran Production. Britain 749,515. May 30, 1956.

KAUFMAN, W., and BAUER, K. [Farbenfabriken Bayer Akt.-Ges.] 141
Process for Partial Depolymerization of Dextrans and Levans.
Germany 1,007,951. Nov. 14, 1957.

KOEPSELL, H.J., TSUCHIYA, H.M., and HELLMAN, N.N. [Assignee A] 142
Method for the Production of Dextran of Relatively Low
Molecular Weight. U.S. 2,660,551. Nov. 24, 1953.

——————— HELLMAN, N.N., and TSUCHIYA, H.M. [Assignee A] 143
Modification of Dextran Synthesis by Means of Alternate
Glucosyl Acceptors. U.S. 2,726,190. Dec. 6, 1955.

KRÜGER, K., and BRÜCKNER, D. 144
Process for the Production of Low-Molecular Dextrans,
Through Direct Synthesis. East Germany 31,300. Jan. 5, 1965.
(Chem. Abstr. 63:6288c. 1965.)

LACKO, L., and MÁLEK, J. 145
Method for Isolating the Clinical Dextran Fraction.
East Germany 19,317. July 22, 1960.*

——————— and MÁLEK, J. 146
A Method of Isolating the Clinical Dextran Fraction.
Britain 877,688. Sept. 20, 1961.

LOCKWOOD, A.R., and SWIFT, G. [East Anglia Chemical Co. Ltd.] 147
Improvements in and Relating to the Degradation of Dextran.
Britain 650,783. March 7, 1951.

——————— and SWIFT, G. [Tell and Usher Ltd.] 148
Degradation of Dextran to Produce a Plasma Substitute.
U.S. 2,565,507. Aug. 28, 1951.

——————— and SWIFT, G. [Dextran Ltd.] 149
Degradation of Dextran. Canada 512,714. May 10, 1955.

LOCKWOOD, A.R. [Dextran Ltd.] 150
Dextran Partially Depolymerized by the Use of Sound Waves.
Canada 516,925. Sept. 27, 1955.

MARGOTTE, E. [Fa. B. Braun] 151
Process for the Manufacture of Dextran Cleavage Products.
Germany (DAS) 1,000,964. Jan. 17, 1957.

MAVI, S.S., NARAYAN, K., and DUBEY, R.S. 152
Clarification of Polysaccharide Hydrolyzates. India 53,655.
Feb. 8, 1956. (Chem. Abstr. 50:9772b. 1956.)

MIODUSZEWSKI, J. Z., and MIODUSZEWSKI, MIECZYSLAWA
[Instytut Farmaceutyczny] 153
Dextran of Controlled Viscosity. Poland 48,285. Aug. 11, 1965.
(Chem. Abstr. 64: 19958b. 1966.)

NOVAK, L.J. [Assignee B] 154
Method for Hydrolyzing Dextran. U.S. 2,789,066. April 16, 1957.

__________ [Assignee B] 155
Process for Dextran Suitable as a Blood-Plasma Substitute.
Germany (DAS) 1,044,361. Nov. 20, 1958.

__________ [Assignee B] 156
Method for Hydrolyzing Dextran. Britain 811,770. April, 8, 1959.*

__________ and WITT, E.E. [Assignee B] 157
Product and Method for Producing Clinical Dextran Including
Ionizable Calcium. U.S. 2,988,482. June 13, 1961.

PAUTARD, F.G.E., and STACEY, M. [Dextran Ltd.] 158
Improvements Relating to the Degradation of Dextran.
Britain 719,382. Dec. 1, 1954.

__________ and STACEY, M. [Dextran Ltd.] 159
Thermal Degradation of Dextran. Mexico 55,844. May 31, 1955.

__________ [Dextran Ltd.] 160
Improvements Relating to the Degradation of Dextran.
Britain 732,923. June 29, 1955.

__________ and STACEY, M. [Dextran Ltd.] 161
Degradation of Dextran. Canada 517,552. Oct. 18, 1955.

__________ and STACEY, M. [Dextran Ltd.] 162
Process for Heat Degradation of Dextran. Sweden (Appln.) 2572/52.
Jan. 4, 1958.*

STACEY, M., and PAUTARD, F.G.E. [Dextran Ltd.] 163
Process for Degrading Dextran in the Presence of a Reducing
Agent. U.S. 2,765,244. Oct. 2, 1956.

STAVELY, H.E. [Commercial Solvents Corp.] 164
Process for Preparing Dextran and the Dextran Resulting
From Said Process. Canada 505,456. August 31, 1954.

__________ [Commercial Solvents Corp.] 165
Clinical Dextran Composition. U.S. 2,708,174. May 10, 1955.

STOYCOS, G.S. [Assignee B] 166
Hydrolysis of Crude Dextran Fermentates. U.S. 2,687,368.
Aug. 24, 1954.

VEB SERUM-WERK BERNBURG 167
Process for the Biological Synthesis of Polysaccharides
Especially Dextran With Clinical Qualities. Austria 6339/57.
Published Feb. 15, 1959.*

________ 168
Biological Synthesis of Dextran. Britain 888,298. Jan. 31, 1962.

VON LILLIENSKIOLD, M. 169
Improvements in the Process for Preparing Dextran Decomposition Products. Belgium 524,053. Nov. 5, 1953.

________ 170
Process for Preparing Decomposition Products of Dextran. Belgium 524,054. Nov. 5, 1953.

________ 171
Process for Decomposing Dextran in a Neutral Medium. Belgium 524,055. Nov. 5, 1953.

________ 172
Process for Degrading Dextran in a Neutral Medium. Argentina 97,433. May 12, 1955.

________ and WILLENBERG, W. [Montagne von Lillienskiold] 173
Process for Manufacture of Dextran Degradation Products for Pharmaceutical Purposes. Germany 930,652. July 21, 1955.

________ and WILLENBERG, W. [Montagne von Lillienskiold] 174
Process for Manufacture of Dextran Degradation Products for Pharmaceutical Purposes. Germany 936,594. Dec. 15, 1955.

________ and WILLENBERG, W. 175
Process for Depolymerization of Dextran in Neutral Medium. Germany 938,209. Jan. 26, 1956.

________ 176
Process of Manufacturing Dextran Degradation Products for Pharamaceutical Purposes. Argentina 101,156. Feb. 10, 1956.

________ 177
Process of Manufacturing Dextran Degradation Products for Pharmaceutical Purposes. Argentina 101,157. Feb. 10, 1956.

________ 178
Process for Preparing Dextran Degradation Products for Pharmaceutical Purposes by Partial Depolymerization of Dextran in an Acidic Medium. Netherlands 83,550. Dec. 15, 1956.

________ 179
Process for the Manufacture of Dextrane Degradation Products for Pharmaceutical Purposes. Austria 189,743. April 25, 1957.

________ 180
Process of Obtaining Degradation Products of Dextran for Pharmacological Purposes. Mexico 59,903. March 19, 1959.

________ 181
Process of Preparing Dextran Degradation Products for Pharmaceutical Purposes. Mexico 59,920. March 24, 1959.

________ 182
Process for the Degradation of Dextran in a Neutral Medium. Mexico 59,921. March 24, 1959.

WILLENBERG, W. [Montagne von Lillienskiold] 183
Process for Manufacture of Dextran Degradation Products for Pharmaceutical Purposes. Switzerland 322,812. June 30, 1957.

WIMMER, E.L. [American Sugar Refining Co.] 184
Treatment of Dextran. U.S. 2,686,778. Aug. 17, 1954.

WOLFF, I.A., MELLIES, R.L., and RIST, C.E. [Assignee A] 185
Fractionation of Dextran Products. U.S. 2,712,007. June 28, 1955.

________ WATSON, P.R., and RIST, C.E. [Assignee A] 186
Thermal Modification of Dextran. U.S. 2,719,147. Sept. 27, 1955.

Cross References: 2, 3, 9, 22, 24, 25, 31, 54.

V. SPECIAL PROCEDURES FOR PURIFYING AND STABILIZING CLINICAL DEXTRANS AND THEIR SOLUTIONS

AKTIEBOLAGET PHARMACIA 187
New Compounds of Hydroxyalkylated Dextran, Their Process
of Production, and Therapeutical Compositions Containing Them.
Belgium 660,444. Sept. 1, 1965. (Chem. Abstr. 64:5196b. 1966.)

——— 188
Dextran Compounds, Methods and Compositions
Britain 1,015,279. Dec. 31, 1965.

——— 189
Hydroxyalkyl Dextrans. Netherlands (Appln.) 6,410,005.
March 1, 1966. (Chem. Abstr. 65:578d. 1966.)

CHARLES E. FROSST & CO. 190
Producing Dextran Products. Australia 163,504. March 4, 1953.

——— 191
Process for Manufacturing Dextran-Base Products.
Belgium 518,334. March 11, 1953.

——— 192
Process for Producing Dextran Products Suitable for
Pharmaceutical and Therapeutic Preparations.
South Africa (Spec.) 435/53. Accepted Aug. 31, 1953.*

——— 193
Process for Producing Dextran Products Suitable for
Pharmaceutical and Therapeutic Preparations. India 49,133.
Sept. 8, 1954.

__________ 194
Process for Preparing Partially Depolymerized Dextran.
Netherlands 80,971. March 15, 1956.

COMMONWEALTH ENGINEERING CO. OF OHIO 195
An Improved Clinical Dextran and Method for Producing the Same. Britain 813,960. May 27, 1959.

FLODIN, P.G.M., GRANATH, KIRSTI A., INGELMAN, B.G.A., and JOHANSSON, CHRISTINA. [Aktiebolaget Pharmacia] 196
New Compounds of Hydroxyalkylated Dextran and Therapeutical Compositions Containing Them. France M 3515. Oct. 4, 1965. (Chem. Abstr. 64:6739c. 1966.)

HULTIN, E., and NORDSTRÖM, L. 197
Dextran Glycosides. Sweden 146,220. July 20, 1954. (Chem. Abstr. 49:1286i. 1955.)

__________ and NORDSTRÖM, L. 198
Blood Plasma Substitute. Britain 718,344. Nov. 10, 1954.

__________ and NORDSTRÖM, L. 199
Process for the Manufacture of Glycosides From Dextran.
Germany 929,248. June 23, 1955.

__________ and NORDSTRÖM, L. 200
Process for Producing Glucosides by Degrading Dextran.
Denmark 84,623. Nov. 25, 1957.

__________ and NORDSTRÖM, L. 201
Dextran Glucosides, Preparation Thereof, and Blood Substitutes Containing the Same. U.S. 2,929,764. March 22, 1960.

LEVI, M.M.I., and LOZINSKI, E. [Charles E. Frosst & Co.] 202
Process for Manufacture of Products Derived From Dextran.
France 1,081,137. June 9, 1954.

LEVI, I., and LOZINSKI, E. [Charles E. Frosst & Co.] 203
Process for Producing Dextran Products Suitable for Pharmaceutical and Therapeutic Preparations.
Britain 730,982. June 1, 1955.

__________ and LOZINSKI, E. [Charles E. Frosst & Co.] 204
Process for Producing Dextran Products Suitable for Pharmaceutical and Therapeutic Preparations.
Canada 518,496. Nov. 15, 1955.

__________ and LOZINSKI, E. [Charles E. Frosst & Co.] 205
Process for Manufacture of Polymeric Homologues of Dextran.
Germany 940,135. March 8, 1956.

__________ and LOZINSKI, E. [Charles E. Frosst & Co.] 206
Process for Producing Dextran Products Suitable for Pharmaceutical and Therapeutic Preparations. U.S. 2,762,727. Sept. 11, 1956.

__________ and LOZINSKI, E. [Charles E. Frosst & Co.] 207
Process for Preparation of Polymeric Homologues of Dextran.
Sweden 160,053. June 13, 1957.

ROSKILDE MEDICAL CO. LTD. 208
Process for Obtaining Partially Depolymerized Products From Dextran. Brazil 64,597. Nov. 7, 1952.*

__________ 209
Process for Manufacturing Depolymerized Dextran Products.
Argentina 90,371. Aug. 18, 1953.*

__________ 210
Process for the Production of Partially Depolymerized Dextran Products. Austria A5913/52. Published Dec. 15, 1955.*

__________ 211
Process for Preparation of Partially Depolymerized Dextran Products. Austria 187,241. Oct. 25, 1956.

__________ 212
Process for Depolymerizing Dextran and Preparation of a Substitute for Blood Plasma From the Depolymerized Product. Netherlands (Appln.) 173,644. May 15, 1957.*

STANKO, G. L. [Abbott Laboratories] 213
Stabilized Dextran Composition. U.S. 3,006,814. Oct. 31, 1961.

WIEMAN, R. L. [Commercial Solvents Corp.] 214
Preparing Clinical Dextran. U.S. 2,784,143. March 5, 1957.

ZEIF, M., and STEVENS, J. R. [J.T. Baker Chemical Co.] 215
Hydrogenated Dextran. U.S. 2,807,610. Sept. 24, 1957.

VI. INDUSTRIAL USES OF DEXTRANS

ALLEN, A. W. [Schering Corp.] 216
Dextran Roentgenographic Preparation. U.S. 2,677,645. May 4, 1954.

BAILEY, L. H., OWEN JR., W. L., and OWEN, W. L. 217
Production of Mud-Laden Drilling Fluids. U.S. 2,360,327. Oct. 17, 1944.

BEHRENS, U., RINGPFEIL, M., GABERT, A., and OTTE, E. 218
Crease-Resistant Finish for Cellulose Textiles. East Germany 42,400. Feb. 5, 1966. (Chem. Abstr. 65:7360a. 1966.)

BOLTON, W. M. [Union Carbide Corp.] 219
Masking Material Particularly for Gas Plating Processes. U.S. 2,970,064. Jan. 31, 1961.

CARLSON, L. J. [Crown Zellerbach Corp.] 220
Process for Preparation of Levoglucosan. U.S. 3,235,541. Feb. 15, 1966.

COHEN, A.B., and SHACKLETT, C.D. [E.I. du Pont de Nemours & Co.] 221
Silver Halide-Based Photographic Emulsions. Belgium 619,939. Jan. 9, 1963. (Chem. Abstr. 58:12108d. 1963.)

__________ [E.I. du Pont de Nemours & Co.] 222
Photographic Emulsions. U.S. 3,203,804. Aug. 31, 1965.

COLGATE-PALMOLIVE CO. 223
Dentifrice Preparations. Britain 753,737. Aug. 1, 1956.

COMMONWEALTH ENGINEERING CO. OF OHIO 224
Seeds Coated With Dextran and Procedure for Their Preparation. Belgium 550,341. Nov. 20, 1956.

__________ 225
New Compositions and Process for Putting Into Application. Belgium 553,805. April 16, 1957.

__________ 226
Pigmented Dextran. Britain 807,234. Jan. 14, 1959.

CYPERT, J.D., and PATTON, J.T. [Jersey Production Research Co.] 227
Stabilized Dextran Solutions. U.S. 3,084,122. April 2, 1963.

DAUL, G.C., DRAKE, T.F., and DUKE, M. W. [Courtaulds, Ltd.] 228
Formaldehyde Modification of Cellulose Conducted in the Presence of a Stiffening Agent and a Lewis Acid Metallic Salt. U.S. 3,275,402. Sept. 27, 1966.

DENISTON, G.L. [Assignee B] 229
Dextran Urea Formaldehyde Compositions. U.S. 2,674,584. April 6, 1954.

__________ [Assignee B] 230
Process of Coating Cotton Yarn. U.S. 2,706,690. April 19, 1955.

__________ [Assignee B] 231
Pigmented Dextran and Method of Producing It.
U.S. 2,725,303. Nov. 29, 1955.

__________ [Assignee B] 232
Pigmented Dextran. Canada 595,593. April 5, 1960.

__________ [Assignee B] 233
Manufacture of Filaments Containing Dextran and Amino-Formaldehyde. Canada 595,942. April 12, 1960.

__________ [Assignee B] 234
Process for Paints From Dextran. Germany 1,102,383.
Nov. 9, 1961.

DEUTSCHE AKADEMIE DER WISSCHENSCHAFTEN ZU BERLIN 235
Process for Making Textiles on the Basis of Cellulose Fibres Resistant Against Swelling and Creasing. Austria A1023/64.
Published Sept. 15, 1964.*

DODD, C.G. [Pure Oil Co.] 236
Thermally Stable Attapulgite-Based Drilling Mud.
U.S. 3,046,221. July 24, 1962.

THE DOW CHEMICAL CO. 237
Process for Preparation of Alumina. France 1,342,576.
Nov. 8, 1963.

DRUMMOND, F.E., and NOVAK, L.J. [Assignee B] 238
Tire Cords and Fabrics and Tires Including the Same.
U.S. 2,839,119. June 17, 1958.

DUMBAULD, G.K., and MONAGHAN, P.H. [Jersey Production Research Co.] 239
Drilling Fluids for Use in Wells. U.S. 3,065,170. Nov. 20, 1962.

E. I. DU PONT DE NEMOURS & CO. 240
Improvements in or Relating to Photographic Silver Halide Emulsions. Britain 875,100. Aug. 16, 1961.

FARRAR JR., G.E., HERSH, M.I., and BARNETT, J.O. [American Home Products Corp.] 241
Process for Making Antibiotic-Enzyme Topical Film-Forming Compositions. U.S. 2,973,300. Feb. 28, 1961.

GARRETT, A.G., and LE STRANGE, R.J. [E. I. du Pont de Nemours & Co.] 242
Haze Reduction of Photographic Emulsions Containing a Covering Power Agent. U.S. 3,272,631. Sept. 13, 1966.

HILER, M.J. [Assignee B] 243
Cigarette Filter Tips From Dextran. U.S. 2,768,913. Oct. 30, 1956.

__________ [Assignee B] 244
Dextran Solutions. U.S. 2,787,518. April 2, 1957.

__________ [Assignee B] 245
Soil Conditioner and Method of Using. U.S. 2,901,864. Sept. 1, 1959.

__________ [Assignee B] 246
Dextran in Aqueous Solution With Boron Trifluoride. Canada 601,499. July 12, 1960.

__________ [Assignee B] 247
Soil Conditioner. Canada 604,969. Sept. 13, 1960.

__________ [Assignee B] 248
Fibers, Yarns and Filaments of Water-Insoluble Dextran. U.S. 2,972,178. Feb. 21, 1961.

__________ [Assignee B] 249
Dextran Containing Sizing Composition. U.S. 2,989,409. June 20, 1961.

__________ [Assignee B] 250
Process and Composition for Stabilizing and Vat Dyeing Regenerated Cellulose Textiles Employing Formaldehyde and Water-Soluble Dextran. U.S. 3,066,996. Dec. 4, 1962.

JENNINGS, A.B. [E.I. du Pont de Nemours & Co.] 251
Improvements in or Relating to Photographic Elements Comprising Silver Halide Emulsions. Australia 243,105. Jan. 31, 1960.

__________ [E.I. du Pont de Nemours & Co.] 252
Photographic Emulsions and Elements. Canada 639,676. April 10, 1962.

__________ [E.I. du Pont de Nemours & Co.] 253
Photographic Emulsions and Elements Containing Dextran. U.S. 3,063,838. Nov. 13, 1962.

KEARNEY, J.J. [Diamond Alkali Co.] 254
Polymerization Process Utilizing Dextran as a Primary Dispersing Agent. U.S. 2,857,367. Oct. 21, 1958.

KOTERA, H., and MATSUMOTO, I. [Dai-Nippon Drug Manufacturing Co.] 255
Waterproof Coating of Drugs. Japan 548('61). Feb. 4, 1961. (Chem. Abstr. 55:21493i. 1961.)

KRESS, B.H. [Quaker Chemical Products Corp.] 256
Method of Insolubilizing Polymeric Hydroxyl-Bearing Compounds. U.S. 2,968,581. Jan. 17, 1961.)

LESINSKI, C.A., and SULLIVAN, E.J. [The Dow Chemical Co.] 257
Method of Employing Dextrans. U.S. 3,085,853. April 16, 1963.

McNULTY, DOROTHY G., and LEININGER, R.I. [Diamond Alkali Co.] 258
Polymerization Employing Polyvinyl Pyrrolidone in Combination with Secondary Dispersants as Suspension Stabilizers.
U.S. 2,890,199. June 9, 1959.

MINGER, F.R., and BENNETT, W.R. [The Dow Chemical Co.] 259
Removal of Impurities From Caustic Soda Solutions.
U.S. 2,958,585. Nov. 1, 1960.

MUGGLETON, P.W., and UNGAR, J. [Glaxo Laboratories Ltd.] 260
Freeze-Drying Process for Biological Products.
Germany 1,028,739. Oct. 9, 1965.

NACK, H.R., and NOVAK, L.J. [Chadeloid Corp.] 261
Varnish Remover. U.S. 2,736,710. Feb. 28, 1956.

NOVAK, L.J. [Assignee B] 262
Collagen Strands and Method of Treating. U.S. 2,748,774.
June 5, 1956.

__________ [Assignee B] 263
Soil Stabilization. U.S. 2,756,134. July 24, 1956.

__________ HOGUE, W.S., and HOMER, H.J. [Assignee B] 264
Colloidal Dispersion of Dextran for Finishing Textiles.
U.S. 2,756,160. July 24, 1956.

__________ and HOGUE, W.S. [Assignee B] 265
Shaped Articles Comprising Regenerated Cellulose.
U.S. 2,768,097. Oct. 23, 1956.

__________ and TYREE, J.T. [Assignee B] 266
Moisture-Resistant Paper. U.S. 2,786,786. March 26, 1957.

__________ and WITT, E.E. [Assignee B] 267
Soil Conditioning and Fertilizing. U.S. 2,826,002.
March 11, 1958.

__________ [Assignee B] 268
Pressure-Sensitive Adhesive Article Containing Dextran.
U.S. 2,855,925. Oct. 14, 1958.

__________ and HOGUE, W.S. [Assignee B] 269
Shaped Articles Comprising Regenerated Cellulose.
U.S. 2,914,414. Nov. 24, 1959.

__________ HOGUE, W.S., and HOMER, H.J. [Assignee B] 270
Dextran as a Starch Substitute. Canada 595,637. April 5, 1960.

__________ and HOMER, H.J. [Assignee B] 271
Dextran as a Starch Substitute. Canada 595,788. April 5, 1960.

__________ [Assignee B] 272
Plastic Materials Comprising Dextran and Method of Preparation.
Canada 626,411. Aug. 29, 1961.

__________ [Assignee B] 273
Pressure-Sensitive Adhesive Article Containing Dextran.
Canada 626,890. Sept. 5, 1961.

__________ [Assignee B] 274
Cigarette Paper Products Comprising Water Insoluble Dextran.
U.S. 3,070,486. Dec. 25, 1962.

__________ [Assignee B] 275
Fibrous Webs, Including Paper, Formed From Water-Insoluble
Dextran Fibers. U.S. 3,070,487. Dec. 25, 1962.

__________ [Assignee B] 276
Resins Comprising Polyesters Modified by Dextran and a Monoethylenically Unsaturated Monomer. Canada 657,132. Feb. 5, 1963.

PAN, S.C., and LERNER, J.L. [Olin Mathieson Chemical Corp.] 277
Improved Fermentation Process for Preparation of Eburicoic Acid. Britain 951,490. March 4, 1964.

PATTON, J.T. [Jersey Production Research Co.] 278
Waterflooding. Venezuela 11,312. July 10, 1961.

__________ [Jersey Production Research Co.] 279
Waterflooding. U.S. 3,042,611. July 3, 1962.

__________ [Jersey Production Research Co.] 280
Waterflooding. Canada 654,774. Dec. 25, 1962.

PEAKE, PATRICIA Q. [Assignee B] 281
Dextran Coated Seeds and Methods of Preparing Them. U.S. 2,764,843. Oct. 2, 1956.

POWERS CHEMCO INC. 282
Light-Sensitive Copying Layer for Printing Plates. Germany 1,071,481. June 2, 1960. (Chem. Abstr. 57:13335i. 1962.)

ROGERS, J. [Assignee B] 283
Dextran-Synthetic Resin Manufacture. Britain 758,112. Sept. 26, 1956.

ROSENBERG, S., and BANDEL, D. [American Machine & Foundry Co.] 284
Smoking Product and Method of Manufacture. U.S. 2,887,414. May 19, 1959.

RUDISELL, S.R. [Phillips Petroleum Co.] 285
Secondary Recovery From Plural Producing Horizons.
U.S. 3,251,413. May 17, 1966.

SCHOTT, H. [E.I. du Pont de Nemours & Co.] 286
Process of Preparing and Extruding an Aqueous Gel of
Polytetrafluoroethylene. U.S. 3,038,870. June 12, 1962.

SCHWARZ, G. [Powers Chemco Inc.] 287
Photosensitive Resists and Photomechanical Process.
U.S. 2,942,974. June 28, 1960.

SHALER, R.G. [American Tansul Co.] 288
Method of Treatment of Ore and Product. U.S. 3,189,557.
June 15, 1965.

SOUTH AFRICAN INVENTIONS DEVELOPMENT CORP. 289
Precipitation of the Organic Colloids. France (DPA) 1,350,895.
Dec. 23, 1963.

SPARKS, W.J. [Jersey Production Research Co.] 290
Viscous Waterflooding. U.S. 3,053,765. Sept. 11, 1962.

TEE PAK INC. 291
Production of Decausticized Polysaccharide Xanthates and
Their Utilization. Britain 981,362. Jan. 27, 1965.

TOULMIN JR., H.A. [Assignee B] 292
Dextran Battery Separator Plate. U.S. 2,624,768. Jan. 6, 1953.

__________ [Assignee B] 293
Paper and Paper-Like Materials Having a Remoistenable
Adhesive Coating. U.S. 2,768,096. Oct. 23, 1956.

__________ [Assignee B] 294
Low-Water-Loss Cement Slurry Comprising Dextran.
U.S. 2,823,135. Feb. 11, 1958.

__________ [Assignee B] 295
Microporous Separators for Storage Batteries and Process for Their Manufacture. Germany 1,047,890. April 14, 1960.

__________ [Assignee B] 296
Printing Pastes for Textiles, Paper, Leather and the Like.
U.S. 2,933,403. April 19, 1960.

VAN HEININGEN, J., DE HAAN, H.J., and JANSSEN, J.D. [N.V. de Bataafsche Petroleum Maatschappij] 297
Procedure for Recovering Petroleum From Rock.
Netherlands 89,580. Nov. 15, 1958.

WENZELBERGER, E.P. [Assignee B] 298
Molding Compositions Comprising Dextran or Derivative and Method of Molding. U.S. 2,826,557. March 11, 1958.

__________ [Assignee B] 299
Polyester Molding Compositions Comprising Dextran or Derivative.
Britain 868,801. May 25, 1961.

WITT, E.E., and NOVAK, L.J. [Assignee B] 300
Soil Conditioning and Stabilizing With a Composition Comprising Low Molecular Weight Dextran. U.S. 2,822,643. Feb. 11, 1958.

__________ and HOLT JR., F.W. [Assignee B] 301
Dextran Bone-Glue Adhesives. U.S. 2,850,398. Sept. 2, 1958.

__________ and HOLT JR., F.W. [Assignee B] 302
Dextran-Sulfite Liquor Solids Adhesives. U.S. 2,933,405.
April 19, 1960.

__________ and HOLT JR., F.W. [Assignee B] 303
Dextrin-Dextran Adhesives. U.S. 2,933,407. April 19, 1960.

__________ and NOVAK, L.J. [Assignee B] 304
Soil Conditioning and Stabilizing With a Composition Comprising Low Molecular Weight Dextran. Canada 602,853. Aug. 2, 1960.

__________ and NOVAK, L.J. [Assignee B] 305
Soil Conditioning and Stabilizing With a Composition Comprising Low Molecular Weight Dextran. Britain 862,712. March 15, 1961.

__________ and HOLT JR., F.W. [Assignee B] 306
Improvements in or Relating to Adhesives. Britain 892,633. March 28, 1962.*

__________ and HOLT JR., F.W. [Assignee B] 307
Dextran Bone-Glue Adhesives. Canada 644,040. July 3, 1962.

Cross References: 41, 563.

VII. FOOD USES OF DEXTRANS AND THEIR DERIVATIVES

BOHN, R.T. [R.K. Laros Co.] 308
Addition of Dextran to Bread Doughs. U.S. 2,983,613. May 9, 1961.

COMMONWEALTH ENGINEERING CO. OF OHIO 309
Coverings for Food Products and Process of Manufacturing Same. France 1,188,399. Sept. 22, 1959.

CORMAN, J., TSUCHIYA, H.M., and STRINGER, C.S. [Assignee A] 310
Enzymatic Preparation of High Levulose Food Additives. U.S. 2,742,365. April 17, 1956.

EAST ANGLIA CHEMICAL CO. LTD. 311
Improvements in or Relating to the Production of Sucrose Syrups.
Britain 657,420. Feb. 29, 1948.

KRAJEWSKI, R.M. [The Dow Chemical Co.] 312
Method of Coating Frozen Meats. U.S. 3,248,232. April 26, 1966.

LACHMANN, A. [American Sugar Refining Co.] 313
Brown Sugar. U.S. 2,910,386. Oct. 27, 1959.

LYCKEBY STARKELSEFORADLIN AKTIEBOLAGET 314
Sorbitol and Dextran Sweeteners. Belgium 647, 581.
Aug. 31, 1964. (Chem. Abstr. 63:12240f. 1965.)

MAHONEY, J.C. 315
Comestible and Process for Preparing Same. U.S. 2,089,217.
Aug. 10, 1937.

MEITO SANGYO K.K. 316
A Process for Preparing a New Milk Drink. Japan 2881/61.
April 11, 1961.*

MORGAN JR., A.I., and GINNETTE, L.F. [Assignee A] 317
Dehydration of Fruit and Vegetable Juices. U.S. 2,955,943.
Oct. 11, 1960.

__________ and GINNETTE, L.F. [Assignee A] 318
Production of Carbohydrates in Readily Dispersible Form.
U.S. 3,064,722. Nov. 20, 1962.

__________ and SCHWIMMER, S. [Assignee A] 319
Preparation of Dehydrated Food Products. U.S. 3,170,803.
Feb. 23, 1965.

NOVAK, L.J. [Assignee B] 320
Food Flavor-Enhancing Material. U.S. 2,785,977. March 19, 1957.

__________ [Midland Chemical Corp.] 321
Gelatin-Fixed Citrus Oils. U.S. 2,786,767. March 26, 1957.

__________ [Assignee B] 322
Preservation of Frozen Foods. U.S. 2,790,720. April 30, 1957.

__________ [Midland Chemical Corp.] 323
Confection Stock Comprising Carboxymethyl Dextran.
U.S. 2,876,102. March 3, 1959.

__________ [Midland Chemical Corp.] 324
Fondants and the Like. U.S. 2,893,873. July 7, 1959.

__________ [Assignee B] 325
Diet Supplements Containing Dextran. Britain 830,951.
March 23, 1960.

__________ [Midland Chemical Corp.] 326
Confection Stock Comprising Carboxymethyl Dextran.
Britain 841,914. July 20, 1960.

__________ [Midland Chemical Corp.] 327
Confection Stock Comprising Carboxymethyl Dextran.
Canada 605,562. Sept. 20, 1960.

__________ [Assignee B] 328
Dietary Factor and Weight Controlling Method. Canada 614,554.
Feb. 14, 1961.

SCHIERBAUM, F. 329
Process for the Production of Pregelatinized Starch for
Foodstuffs. East Germany 38,076. April 15, 1965.

SMITH, T.A., MALONE, T.F., and MECH, P.J. [Monsanto Co.] 330
Cyclamate-Saccharin Sweetener With Less Bitterness and Aftertaste. Belgium 660,615. Sept. 6, 1965. (Chem. Abstr. 64:1906d. 1966.)

TOULMIN JR., H.A. [Assignee B] 331
Edible Container for Ice Cream and the Like. U.S. 2,731,349. Jan. 17, 1956.

__________ [Assignee B] 332
Normally Foam-Producing Beverages. U.S. 2,758,926. Aug. 14, 1956.

__________ [Assignee B] 333
Method of Preserving Shrimp. U.S. 2,758,929. Aug. 14, 1956.

__________ [Assignee B] 334
Method of Preserving Shrimp. U.S. 2,758,930. Aug. 14, 1956.

__________ [Midland Chemical Corp.] 335
Icing Compositions Comprising a Carboxymethyl Dextran and Method of Producing the Same. U.S. 2,789,911. April 23, 1957.

__________ [Assignee B] 336
Method of Preserving Food Products. U.S. 2,790,721. April 30, 1957.

__________ [Midland Chemical Corp.] 337
Thickened Fruit Composition Comprising Carboxymethyl Dextran. U.S. 2,813,797. Nov. 19, 1957.

__________ [Assignee B] 338
Dry Pudding Mix Comprising Carboxymethyl Dextran. U.S. 2,818,343. Dec. 31, 1957.

__________ [Assignee B] 339
Stabilized and Bodied Ice Cream. U.S. 2,823,128. Feb. 11, 1958.

__________ [Midland Chemical Corp.] 340
Stabilized Bodied Milk and Frozen Milk Products Comprising Carboxymethyl Dextran. U.S. 2,834,684. May 13, 1958.

__________ [Union Carbide Corp.] 341
Beverage Concentrates and Syrups. U.S. 2,864,707. Dec. 16, 1958.

__________ [Assignee B] 342
Normally Foam-Producing Beverages. Canada 573,274. March 31, 1959.

__________ [Assignee B] 343
Gum Confections and Manufacture Thereof. U.S. 2,938,797. May 31, 1960.

__________ [Assignee B] 344
Icing Composition. U.S. 2,938,798. May 31, 1960.

__________ [Assignee B] 345
Dry Pudding Composition. U.S. 2,938,799. May 31, 1960.

__________ [Assignee B] 346
Dry Pudding Mix Comprising Carboxymethyl Dextran. Canada 605,568. Sept. 20, 1960.

__________ [Assignee B] 347
Dry Pudding Mix Comprising Carboxymethyl Dextran. Britain 871,478. June 28, 1961.*

__________ [Midland Chemical Corp.] 348
Stabilized Bodied Milk and Frozen Products Comprising Carboxymethyl Dextran. Canada 625,241. Aug. 8, 1961.

WADSWORTH, D.V., and HUGHES, MARY F. [Refined Syrups and Sugars Inc.] 349
Sugar Sirup and Process. U.S. 2,409,816. Oct. 22, 1946.

VIII. PHARMACEUTICAL APPLICATIONS OF DEXTRANS AND THEIR DERIVATIVES

ADAMS JR., E.C., and NOVAK, N.R. [Miles Laboratories Inc.] 350
Stabilized Occult Blood Diagnostic. U.S. 3,252,762. May 24, 1966.

__________ and HAITSMA, CORNELIA T. [Miles Laboratories Inc.] 351
Occult Blood Diagnostic Composition With Color Enhancing Agent. U.S. 3,290,117. Dec. 6, 1966.

AKTIEBOLAGET ASTRA, LINDVALL, S., and HOGBERG, K.G. 352
Iron Preparations for Intramuscular Injections. South Africa 648/61. May 16, 1962.

AKTIEBOLAGET LEO 353
Method for Producing Preparations With Protracted ACTH Effect and Such Preparations. Britain 761,061. Nov. 7, 1956.

AKTIEBOLAGET PHARMACIA 354
Method for Separating Substances With Different Molecular Sizes From a Solution. Britain 865,265. April 12, 1961.

AKTIESELSKABET ROSCO 355
Ferric-Dextran Complexes. Netherlands (Appln.) 6,516,637. June 30, 1966. (Chem. Abstr. 66:5767d. 1967.)

ASTRA APOTEKARNES AKTIEBOLAGET 356
New Injectable Iron Composition. Belgium 609,537. April 24, 1962.*

BACKMAN, S.V., EMBRING, P.G., and INGELMAN, B.G.A. [Aktiebolaget Pharmacia] 357
Composition for X-Ray Diagnosis. Sweden (Appln.) 174,789. Dec. 12, 1952. (Chem. Abstr. 56:4879d. 1962.)

BAUMGARTEN, W., and COLE, ROSE B. [Merck & Co. Inc.] 358
Strepokinase Purification Process. U.S. 3,107,203.
Oct. 15, 1963.

BEHRENS, U., RINGPFEIL, M., and GABERT, A. 359
Iron Preparations for Injections. U.S.S.R. 145,986.
April 6, 1962. (Chem. Abstr. 57:9967e. 1962.)

__________ RINGPFEIL, M., and GABERT, A. 360
Process for Production of Water-Soluble Iron Complex Salts
of Carboxymethyl Dextran. East Germany 23,491. Aug. 6, 1962.
(Chem. Abstr. 65:792d. 1966.)

__________ RINGPFEIL, M., and GABERT, A. [VEB Serum-Werk Bernburg] 361
Method for the Production of Dextran Phosphoric Acid Ester.
East Germany 24,814. March 1, 1963.

__________ RINGPFEIL, M., and GABERT, A. 362
Process for Production of Dextran Derivatives.
East Germany 25,156. April 22, 1963.

__________ RINGPFEIL, M., and GABERT, A. [VEB Serum-Werk Bernburg] 363
Process for the Production of Dextran Phosphate.
Germany (DAS) 1,149,702. June 6, 1963.

__________ RINGPFEIL, M., and GABERT, A. [VEB Serum-Werk Bernburg] 364
Process for the Production of Sodium Salts of Dextran
Sulphuric Acid Esters Inhibiting Coagulation of Blood.
Germany 1,152,396. April 30, 1964.

__________ DORFEL, K., RINGPFEIL, M., GABERT, A., and THURNHEIM, F. 365
Process for the Production of Novel, Autosterile Products on
the Basis of Dextran Formaldehyde. East Germany 28,595.
May 25, 1964.

__________ RINGPFEIL, M., GABERT, A., and FREUDENBERG, R. 366
Process for the Production of Ointment Base Free of Fat.
East Germany 31,760. Oct. 5, 1964.

BEHRINGWERKE AKT.-GES. 367
Process for Preparation of Streptokinase. Belgium 631,424.
Nov. 18, 1963.

______ 368
Isolation of l'a-Antitrypsin. Netherlands (Appln.) 06622/64.
Dec. 12, 1964.*

______ 369
Isolation of l'a-Antitrypsin. Belgium 649,238. Dec. 14, 1964.*

BENGER LABORATORIES, LTD. 370
Improved Therapeutic Preparations of Iron. India 51,304.
July 25, 1955.

BERGER, C., and NOVAK, L.J. [Assignee B] 371
Process for the Production of Iron-Containing Complex Compounds
of the Dextran Glycolic Acid. Germany 1,065,402. March 3, 1960.

BERGKVIST, R. [Aktiebolaget Astra] 372
Process for Isolating and Separating Proteolytic Enzymes.
U.S. 3,281,331. Oct. 25, 1966.

BISHOP, A.E. [Assignee B] 373
Fibers and Filaments from Dextran Derivatives. Britain 836,907.
June 9, 1960.

BRANDON, F.B., and TAYLOR, A.R. [Parke, Davis & Co.] 374
Antigen Products and Means for Producing the Same.
U.S. 3,105,012. Sept. 24, 1963.

BRISTOL-MYERS CO. 375
A Complex Polysaccharide for Therapeutic Use and Process
for Its Preparation. Britain 930,041. July 3, 1963.

BROWN, G.R. [Mallinckrodt Chemical Works] 376
Barium Sulfate and Low Viscosity Monosaccharide Polymer
X-Ray Contrast Media. U.S. 3,236,735. Feb. 22, 1966.

THE CENTRAL PHARMACAL CO. 377
Pharmaceutical Containing a Carboxyalkyl Dextran.
Belgium 594,311. Feb. 22, 1961.*

__________ 378
Pharmaceutical Drug Compositions and Methods of Making Such
Compositions. Britain 904,874. Sept. 5, 1962.

CHEMICALS INC. 379
New Therapeutic. Belgium 589,355. Aug. 1, 1960.*

__________ 380
Composition Comprising a Ferric Hydroxide Hydrogenated Dextran
Complex and Process for Preparing the Same. India 71,198.
Aug. 29, 1961.*

__________ 381
Hydrogenated Dextrans and Complexes Thereof and Preparation
of Same. Britain 937,235. Sept. 18, 1963.

__________ 382
Process for Preparation of a Therapeutically Active
Complex of Ferrihydroxide With a Hydrogenated Dextran.
Netherlands 120,572. Sept. 15, 1965.*

CHRISTENSEN, H.M. [Roskilde Medical Co. Ltd.] 383
Method for Preparing an Iron Preparation for Injection.
Japan 5,293('63). May 7, 1963.*

__________ [Roskilde Medical Co. Ltd.] 384
Process for Production of an Iron-Dextran Preparation
Suitable for Injection. Germany (DAS) 1,149,137. May 22, 1963.

CHUGAI SEIYAKU K.K. 385
Sulphates of Polysaccharides. Belgium 612,153. April 16, 1962.*

________ 386
Sulfates of Slightly Polymerized Polysaccharides.
France (DPA) M1,714. Feb. 25, 1963.

________ 387
Process for the Preparation of Sulphates of Lightly Polymerised Polysaccharides. Netherlands (Appln.) 273,016.
Sept. 10, 1964.*

CIBA SOCIETA ANONYME 388
A Process for the Obtaining of a New Protein.
Argentina 142,527. May 5, 1965.*

________ 389
Protein. France 1,405,243. July 9, 1965.*

________ 390
Preparation of BCG Vaccines. Belgium (Appln.) 664,429.
Nov. 25, 1965.*

COMMONWEALTH ENGINEERING CO. OF OHIO 391
Fibers and Filaments Produced in Part From Dextran Derivatives.
Belgium 556,873. Aug. 15, 1957.

________ 392
Carboxymethyl-Dextran-Iron Complexes. Belgium 571,966.
Jan. 31, 1959.

________ 393
New Fluff Powder Base. Belgium 577,173. Aug. 16, 1959.*

________ 394
Sulphuric Ester of Dextranic Acid. Belgium 577,947.
Aug. 16, 1959.*

——————— 395
An Iron-Carboxyalkyl Dextran Complex and Method for the Production Thereof. Italy 603,423. April 4, 1960.

DANIELS, E.G., and HINMAN, J.W. [The Upjohn Co.] 396
Extracts of Mammalian Kidney. U.S. 3,282,788. Nov. 1, 1966.

DE VRIES, J.W. [Organon, Inc.] 397
Purification of Fat Mobilizing Substances. U.S. 3,275,515. Sept. 27, 1966.

DOERFEL, K., GABERT, A., and TURNHEIM, F. 398
Gelled Hair Dyes. East Germany 44,479. Jan. 1, 1966. (Chem. Abstr. 64:15673a. 1966.)

ELDON, K.E.H. [Nordisk Insulin-laboratorium] 399
Blood Grouping Card. U.S. 2,770,572. Nov. 13, 1956.

ELLIS, G.P., and LEE, T.B. [Benger Laboratories Ltd.] 400
Chloral-Dextran Complex. Britain 1,046,612. Oct. 26, 1966. Chem. Abstr. 66:5757s. 1967.)

EPPSTEIN, S.H. [The Upjohn Co.] 401
Pituitary Gland Extract and Process for Its Manufacture. U.S. 3,275,516. Sept. 27, 1966.

FEDOROŇKO, M., and SUCHÝ, J. 402
Colloid Solution of Ferric Hydroxide Containing Glycides. Czechoslovakia 97,467. Nov. 15, 1960. (Chem. Abstr. 55:27795f. 1961.)

FEINSTONE, W.H., and BLACK, A.S. [Plough, Inc.] 403
Procedure to Suppress Wrinkles of the Skin. France 1,440,233. May 27, 1966. (Chem. Abstr. 66:22132j. 1967.)

FLODIN, P.G.M., JOHANSSON, J.A.O., and JOHANSSON, H.L.E.
[Aktiebolaget Pharmacia] 404
Calcium Salt of Dextran for Treating Cattle Delivery
Paresis. U.S. 3,262,847. July 26, 1966.

FLORAMO, N.A. [Chemicals Inc.] 405
Iron Hydrogenated Dextran. South Africa 1209/60. Oct. 18, 1960.

__________ [Chemicals Inc.] 406
Iron Hydrogenated Dextran. Canada 623,770. Dec. 12, 1961.

__________ [Chemicals Inc.] 407
Iron Hydrogenated Dextran. Canada 632,769. Dec. 12, 1961.

__________ [Chemicals Inc.] 408
Iron Hydrogenated Dextran. U.S. 3,022,221. Feb. 20, 1962.

__________ [Chemicals Inc.] 409
Iron Hydrogenated Dextran. Australia 241,768. Nov. 21, 1962.

__________ 410
Method for Preparing Iron Hydrogenated Dextran. Japan 18,747('62).
Dec. 14, 1962.*

__________ [Chemicals Inc.] 411
Process for Making Iron Hydrogenated Dextran. U.S. 3,234,209.
Feb. 8, 1966.

__________ [Chemicals Inc.] 412
Process for the Production of a Therapeutical Preparation
Consisting of a Colloidal Complex of Hydrogenated Dextran
and Ferric Hydroxide. Germany (DAS) 1,212,677. March 17, 1966.

FORD, M.D., and NOVAK, L.J. [The Central Pharmacal Co.] 413
Calcium Substitution Products of Dextran. U.S. 2,996,496.
Aug. 15, 1961.

"FO-WE" FORSCHUNGS-UND VERWERTUNGS-ANSTALT IN VADUZ 414
Method for the Production of a Therapeutically Effective
Product. Austria 222,807. Aug. 10, 1962.

FOWLER, F., and GOLBERG, L. [Benger Laboratories Ltd.] 415
Antimony Preparations. U.S. 3,085,943. April 16, 1963.

__________ [Benger Laboratories Ltd.] 416
Inhalant Composition and Method of Making Same.
U.S. 3,155,573. Nov. 3, 1964.

FRITSCH, W., HAEDE, W., SCHERER, H., and KEMPE, W. [Farbwerke Hoechst Akt.-Ges.] 417
Process for Stabilizing Anionic and Cationic Ester Salts
of 21-Hydroxy-20-Keto-Steroids in an Aqueous Solution.
Canada 663,613. May 21, 1963.

GALLO, A. [Società Farmaceutici Italia] 418
Process for Production of Phosphoric Esters of Dextran,
Antilipemic and Not Anticoagulant. Belgium 549,700.
Nov. 16, 1956.

__________ [Società Farmaceutici Italia] 419
Process for Manufacture of Sodium Salts of Dextran-Phosphoric
Acid-Esters. **Germany** 1,040,013. March 19, 1959.

__________ [Società Farmaceutici Italia] 420
Phosphoric Esters of Dextran as Nonanticoagulant
Anticholesteremics and Process for Their Preparation.
Canada 613,126. Jan. 24, 1961.

GOLBERG, L., and FOWLER, F. [Benger Laboratories Ltd.] 421
Improved Therapeutic Preparations of Antimony.
South Africa 3104/60. Jan. 4, 1961.

__________ and FOWLER, F. [Benger Laboratories Ltd.] 422
Improved Therapeutic Preparations of Antimony. Britain 895,391.
May 2, 1962.

THE GOVERNORS OF THE UNIVERSITY OF TORONTO 423
Production of High Activity Fibrinolytic Agents. Britain 1,022,026. March 9, 1966.

GRÖNWALL, A.J.T., INGELMAN, B.G.A., and MOSIMANN, H. 424
Compounds Inhibiting the Coagulation of Blood. Sweden 118,014. Jan. 28, 1947. (Chem. Abstr. 41:6023f. 1947.)

GROVES, M.J. [Boots Pure Drug Co. Ltd.] 425
New Parasiticidal Compounds. South Africa 1,539/63. Oct. 30, 1963.

__________ [Boots Pure Drug Co. Ltd.] 426
New Parasiticidal Compounds. Britain 959,962. June 3, 1964.

HALPERN, A. [Schieffelin & Co.] 427
Ophthalmic Preparations. Canada 604,255. Aug. 30, 1960.

HECKEL, H.C.N., and JEFFERSON, R.T. [The Central Pharmacal Co.] 428
Benzyl Dextran-Amphetamine and Method of Making Same. U.S. 3,063,906. Nov. 13, 1962.

__________ and JEFFERSON, R.T. [The Central Pharmacal Co.] 429
Preparation of Medicated Benzyl Dextran Gradual Release Therapeutic Products Containing Up to 5 Percent Benzyl Alcohol. U.S. 3,130,125. April 21, 1964.

__________ and WITT, E.E. [The Central Pharmacal Co.] 430
Water-Soluble Iron Complexes of Carboxymethyl Dextran. U.S. 3,151,107. Sept. 29, 1964.

HEIMBURGER, N., SCHMIDTBERGER, R., and SCHWICK, G. [Behringwerke Akt.-Ges.] 431
Process for Preparing a Streptokinase. U.S. 3,186,920. June 1, 1965.

HERB, J.R. [R.K. Laros Co.] 432
Dextran-Iron Complex and Process for Making Same.
U.S. 2,885,393. May 5, 1959.

__________ [R.K. Laros Co.] 433
Iron-Dextran Composition. Canada 625,770. Aug. 15, 1961.

HEROLD, M., HOFMAN, J., MÁLEK, P., ČAPKOVÁ, J., HEŘMANSKÝ, M., 434
VONDRÁČEK, M., and KOLC, J.
Medicinal Preparations With Increased Faculty to Enter the
Lymphatic System. Czechoslovakia 90,981. July 15, 1959.
(Chem. Abstr. 54:14594d. 1960.)

HOFFMANN - LA ROCHE & CO. AKT.-GES. 435
Process for Preparation of Polysaccharide Polysulfonic
Acid Esters. Switzerland 326,792. Feb. 15, 1958.
(Chem. Abstr. 52:18245b. 1958.)

INGELMAN, B.G.A. and MÅRTENSSON, O. [Aktiebolaget Pharmacia] 436
Sulfuric Acid Esters of Polysaccharides. Sweden 165,090.
Oct. 21, 1958. (Chem. Abstr. 54:5494h. 1960.)

ISBELL, H.S. [The United States of America as Represented by
the Secretary of Commerce] 437
Process for Labelling Polysaccharides With C^{14} and
Products Resulting Therefrom. U.S. 2,653,931. Sept. 29, 1953.

JAMES, A.E., and RICKETTS, C.R. [National Research Development Corp.] 438
Improvements Relating to the Manufacture of Sulfuric Esters
of Dextran. Britain 715,821. Sept. 22, 1954.

__________ and RICKETTS, C.R. [National Research Development Corp.] 439
Fractional Precipitation of Dextran Sulphate. Canada 551,689.
Jan. 14, 1958.

__________ and RICKETTS, C.R. [National Research Development Corp.] 440
Process for Manufacturing a Dextran Sulfate Suitable for
Therapeutic Purposes. Germany 970,763. Oct. 30, 1958.

JANISZEWSKI, E. 441
Stable, Aqueous, Colloidal Solutions of Water-Insoluble Vitamins. Poland 40,968. April 1, 1958. (Chem. Abstr. 54:13563d. 1960.)

JOHNSON, R.H. [The Upjohn Co.] 442
Stable Hydrocortisone Solution. U.S. 2,793,159. May 21, 1957.

KATSUI, G., TAKEBE, T., and FUJITA, J. [Eisai Co. Ltd.] 443
Colloidal Solutions of Metals and Dextran for Injection. Japan 5598('59). June 29, 1959. (Chem. Abstr. 53:22763d. 1959.)

________ [Eisai Co. Ltd.] 444
Stabilization of Dextran-Iron Colloid. Japan 1998('61). March 23, 1961. (Chem. Abstr. 55:21493i. 1961.)

KRUEGER, W., STOJANOW, I., and MEESER, G. 445
Purification of Rennet Enzyme. East Germany 41,935. Oct. 15, 1965. (Chem. Abstr. 64:20110f. 1966.)

LABORATORIEN HAUSMANN AKT.-GES. 446
Process for the Production of Therapeutically Applicable Ferro-Polyisomaltosate Complexes. Austria A1133/58. Published Dec. 15, 1958.*

________ 447
Iron-Polyisomaltoside Complexes. Belgium 581,929. Dec. 15, 1959.*

LABORATORIEN HAUSMANN LTD. 448
Improvements in Iron Polyisomaltose Complexes for Therapeutical Application. India 69,671. Jan. 12, 1961.*

LABORATORIEN HAUSMANN AKT.-GES. 449
Method of Producing a Therapeutically Active Ferric Hydroxydepolyisomaltose Complex. Denmark 93,262. April 24, 1962.*

LACKO, L., and MÁLEK, J. 450
Chemotherapeutics With Prolonged Effect. Czechoslovakia 90,794.
June 15, 1959. (Chem. Abstr. 54:7987f. 1960.)

LEWIS, S.H., and WESTFALL, R.J. [Armour Pharmaceutical Co.] 451
Therapeutic Iron Dextran Preparations. Britain 1,017,422.
Jan. 19, 1966.

LINDVALL, S., and HÖGBERG, K.G. [Aktiebolaget Astra] 452
Iron Preparations for Intra-Muscular Injection.
Canada 659,420. March 12, 1963.

__________ and HÖGBERG, K.G. [Aktiebolaget Astra] 453
Iron Preparations for Intramuscular Injection.
U.S. 3,252,863. May 24, 1966.

LONDON, E., and TWIGG, G.D. [Benger Laboratories Ltd.] 454
Process for Manufacturing a Colloidal Iron Preparation.
Germany 938,502. Feb. 2, 1956.

__________ and TWIGG, G.D. [Benger Laboratories Ltd.] 455
Improved Therapeutic Preparations of Iron. Britain 748,024.
April 18, 1956.

__________ and TWIGG, G.D. [Benger Laboratories Ltd.] 456
Therapeutic Preparations of Iron. U.S. 2,820,740.
Jan. 21, 1958.

__________ and TWIGG, G.D. [Benger Laboratories Ltd.] 457
Therapeutic Preparations of Iron. Canada 556,877.
May 6, 1958.

__________ and TWIGG, G.D. [Benger Laboratories Ltd.] 458
Therapeutic Preparations of Iron. U.S. Reissue 24,642.
April 28, 1959.

MATHER, ADALINE N., and MAGUIRE, R. [Baxter Laboratories Inc.] 459
Method of Purification of Streptokinase. U.S. 3,255,094.
June 7, 1966.

MEITO SANGYO K.K. 460
A Method for Producing a Stable Colloidal Drug of Iron
Hydroxide. Japan 21,548/61. Filed: March 19, 1958.*

__________ 461
Enteric-Coated Tablets of Dextran Sulphate Ester and Method of
Preparation Thereof. Britain 953,626. March 25, 1964.

MESSING, R.A. [Ethicon Inc.] 462
Process for Enzyme Purification. U.S. 3,104,206. Sept. 17, 1963.

MICHAEL, S.E., and TUNNAH, G.W. [Crookes Laboratories Ltd.] 463
Improvements in and Relating to the Stability of
Antihemophilic Globulin (Factor VIII). Britain 941,019.
Nov. 6, 1963.

MORII, E., JASUE, S., IWATA, K., and TAGA, Y. [Meito Kogyo Co. Ltd.] 464
Blood-Coagulation Inhibitors. Japan 4896('60). May 9, 1960.
(Chem. Abstr. 55:16920a. 1961.)

__________ [Meito Sangyo K.K.] 465
Skin Cosmetic. Japan 2,647('64). March 13, 1964.*

__________ IWATA, K., and KOKKOKU, H. [Meito Sangyo K.K.] 466
Sodium and Potassium Salts of the Dextran Sulphuric Acid
Ester Having Substantially No Anticoagulant Activity but
Having Lipolytic Activity and the Method of Preparation
Thereof. U.S. 3,141,014. July 14, 1964.

MUGGLETON, P.W., and UNGAR J. [Glaxo Laboratories Ltd.] 467
Use of Dextran in Freeze-Drying Process. U.S. 2,908,614.
Oct. 13, 1959.

MÜLLER, A., and BERSIN, T. [Laboratorien Hausmann Akt.-Ges.] 468
Process for Production of Iron-Polyisomaltose-Complex.
Austria 208,003. March 10, 1960.

__________ and BERSIN, T. [Hausmann Laboratories Ltd.] 469
Process for the Manufacture of Iron-Polyisomaltose Complex
for Therapeutical Purposes. Canada 623,411. July 4, 1961.

__________ and BERSIN, T. [Hausmann Laboratories Ltd.] 470
Iron Polyisomaltose Complexes for Therapeutical Application.
Canada 623,412. July 4, 1961.

__________ and BERSIN, T. 471
Process for Preparing an Iron Hydroxide Polyisomaltose
Complex and the Resulting Product. U.S. 3,100,202.
Aug. 6, 1963.

__________ and BERSIN, T. [Laboratorien Hausmann Akt.-Ges.] 472
Process for Production of Therapeutically Applicable Iron
Preparations. Switzerland 370,194. Aug. 15, 1963.

__________ and BERSIN, T. [Laboratorien Hausmann Akt.-Ges.] 473
Method for Production of Ferric-Dextran-Complex Compounds
to be Used as Therapeutics. Germany 1,172,250. June 18, 1964.*

__________ and BERSIN, T. [Laboratorien Hausmann Akt.-Ges.] 474
Improvements in or Relating to Therapeutic Iron Preparation.
Britain 985,206. March 3, 1965.*

__________ and BERSIN, T. [Laboratorien Hausmann Akt.-Ges.] 475
Process for Production of Non-Ionic Ferric Hydroxide-Dextran-
Complexes for Therapeutical Use. Germany 1,196,629. July 15, 1965.*

MULLER, F. [Knoll Akt.-Ges.-Chemische Fabriken] 476
Process for the Production of Gastrointestinally
Resorbable Preparations of Medicaments. Germany (DAS) 1,174,452.
July 23, 1964.

NATIONAL RESEARCH DEVELOPMENT CORP. 477
Sulphuric Esters of Polysaccharides. Australia 159,886. August 25, 1952.*

__________ 478
Process for Fractionating Dextran Sulfate. Denmark (Appln.) 2695/52. August 6, 1956.*

__________ 479
Process of Preparing Dextran Sulphate for Therapeutical Use. Netherlands (Appln.) 172,049. May 16, 1958.*

NEGREVERGNE, G. [Purdue Frederick Co.] 480
Phenylbutazone Derivatives. France M1624. Jan. 21, 1963. (Chem. Abstr. 59:1649c. 1963.)

NITTA, Y., NAWATA, Y., and NAMEKATA, M. [Chugai Seiyaku K.K.] 481
Sulfates of Low Polymerized Polysaccharides. Canada 703,978. Feb. 16, 1965.

NOVAK, L.J., and HOGUE, W.S. [Midland Chemical Corp.] 482
Contrast Compositions Stabilized With Carboxymethyl Dextran Ether. U.S. 2,746,906. May 22, 1956.

__________ [Assignee B] 483
Dextran Compound Fatty Acid Ester Lipstick. U.S. 2,749,276. June 5, 1956.

__________ [Assignee B] 484
Iodo-Carboxymethyl Dextran and Methods of Making It. U.S. 2,811,516. Oct. 29, 1957.

__________ [Assignee B] 485
Iodo-Dextran and Methods for Producing the Same. U.S. 2,811,517. Oct. 29, 1957.

__________ [Assignee B] 486
Carboxymethyl Dextran-Iron Complexes. U.S. 2,856,398. Oct. 14, 1958.

__________ [Assignee B] 487
Dusting Powder Including Salts of Carboxymethyl Dextran. U.S. 2,876,165. March 3, 1959.

__________ [Assignee B] 488
Iodo-Dextran and Methods for Producing the Same. Britain 815,421. June 24, 1959.*

__________ [Assignee B] 489
Iodo-Carboxymethyl Dextran and Methods of Making It. Britain 823,360. Nov. 11, 1959.

__________ and TYREE, J.T. [Assignee B] 490
Higher Fatty Acid Esters of Dextran. Canada 612,791. Jan. 17, 1961.

__________ [Assignee B] 491
Iodo-Carboxymethyl Dextran and Methods of Making It. Canada 617,654. April 4, 1961.

__________ [Assignee B] 492
Iodo-Dextran and Method for Producing the Same. Canada 617,655. April 4, 1961.

__________ [The Central Pharmacal Co.] 493
Products Having Retardation Effects for Pharmaceutical Compositions. France M561. July 3, 1961.

__________ [Assignee B] 494
Sulfuric Acid Esters of Dextranic Acid. Britain 873,995. Aug. 2, 1961.*

__________ [Assignee B] 495
Method of Making a Composition of Carboxymethyl Dextran
and an Antibiotic. U.S. 2,997,423. Aug. 22, 1961.

__________ [Assignee B] 496
Preparation of Carboxymethyl Dextran-Iron Complexes.
U.S. 3,000,872. Sept. 19, 1961.

__________ [Assignee B] 497
Carboxymethyl Dextran-Iron Complexes. Britain 891,769.
March 21, 1962.

__________ [Assignee B] 498
A Dusting Powder Including Carboxymethyl Dextran Salts.
Britain 909,703. Oct. 31, 1962.*

__________ [The Central Pharmacal Co.] 499
Carboxymethylbenzyl Dextran Dextro-Amphetamine.
U.S. 3,063,905. Nov. 13, 1962.

__________ [The Central Pharmacal Co.] 500
Carboxymethylbenzyl Dextran Dextro Amphetamine.
Canada 673,532. Nov. 5, 1963.

__________ [The Central Pharmacal Co.] 501
Oral Pharmaceutical Products Prepared With Carboxymethylbenzyl
Dextran Having a Low Carboxymethyl D.S. of 0.15.
U.S. 3,130,126. April 21, 1964.

__________ [The Central Pharmacal Co.] 502
Bearer Substance for Pharmaceutical Products.
Germany (DAS) 1,177,773. Sept. 10, 1964.

NOVO TERAPEUTISK LABORATORIUM A/S 503
Human or Animal Plasminogen. Belgium 663,155. Oct. 28, 1965.*

__________ 504
Production of Human or Animal Plasminogen. Netherlands (Appln.) 05,366/65. Oct. 28, 1965.*

PARCELLS, A.J. [The Upjohn Co.] 505
Process for the Purification of Growth Hormone. U.S. 3,264,186. Aug. 2, 1966.

RICKETTS, C.R. [National Research Development Corp.] 506
Anticoagulant From Dextran Sulphate. New Zealand (Appln.) 108,022. Sept. 22, 1952.*

__________ [National Research Development Corp.] 507
Improvements in Anticoagulants. Britain 695,787. Aug. 19, 1953.

__________ and WALTON, K.W.W.H. [National Research Development Corp.] 508
Dextran Sulfate as Anticoagulant, Process of Preparing Same, and Sterile Solution Thereof. U.S. 2,715,091. Aug. 9, 1955.

__________ and WALTON, K.W.W.H. [National Research Development Corp.] 509
Process for Producing Anticoagulants. Germany 954,592. Dec. 20, 1956.

__________ and WALTON, K.W.W.H. [National Research Development Corp.] 510
Anticoagulants Consisting of Sulfonated Dextrans. Canada 567,761. Dec. 23, 1958.

ROCADOR, S.A. [Sociedad Quimico Farmacéutica de los Establecimientos Rocafort Doria, Sociedad Anon.] 511
Colloidal Ferric Oxide for Intramuscular Injection. Spain 248,865. April 25, 1959. (Chem. Abstr. 54:25605i. 1960).

__________ 512
Process for the Preparation of a Complex of Iron Oxide and Dextranic Acids. Spain 282,099. Nov. 10, 1962.*

ROSKILDE MEDICAL CO. LTD. 513
Method for the Production of an Iron Preparation for
Injection. India 69,170. March 23, 1961.*

RUSSELL, K.L., and NELSON JR., M.F. [Colgate-Palmolive Co.] 514
Dentifrice Containing Dextran. New Zealand (Appln.) 111,163.
Feb. 17, 1954.

__________ and NELSON JR., M.F. [Colgate-Palmolive Co.] 515
Dextran Dentifrices. Germany 952,210. Nov. 15, 1956.

__________ and NELSON JR., M.F. [Colgate-Palmolive Co.] 516
Dextran Dentifrices. U.S. 2,779,708. Jan. 29, 1957.

SAUNDERS, J.F. [The United States of America as Represented by
the Secretary of the Navy] 517
Process for Freezing Blood. U.S. 3,177,117. April 6, 1965.

SCHULTZE, H.E., and HEIMBURGER, N. [Behringwerke Akt.-Ges.] 518
Process for Isolating α_1-Antitrypsin. U.S. 3,293,236.
Dec. 20, 1966.

SOCIETÀ FARMACEUTICI ITALIA 519
Phosphoric Esters of Dextran and Salts Thereof and Process
for Their Preparation. Britain 800,484. Aug. 27, 1958.

SYNOWIEDZKI, Z. [Instytut Weterynarii Zaklad Technologii i
Kontroli Lekow Weterynaryjnych] 520
Complex Compounds of Iron With Carbohydrates.
Poland 45,026. Oct. 10, 1961. (Chem. Abstr. 57:9966h.
1962.)

TABE, H. [Takeda Chemical Industries Ltd.] 521
Dextran Compound With Iron. Japan 13,098('61).
Appl. Sept. 26, 1956. (Chem. Abstr. 56:4878h. 1962.)

__________ [Takeda Pharmaceutical Industries Ltd.] 522
Iron Compound With Dextran. Japan 7500('60). June 20, 1960.
(Chem. Abstr. 55:5880c. 1961.)

TAISHO SEIYAKU K.K. 523
Production of Cellulase. Japan 2878/65. Feb. 15, 1965.*

THULIN, K.E. [Aktibolaget Pharmacia] 524
Way of Making Stable Penicillin Solutions With Prolonged
Effectiveness. Sweden 121,752. April 1, 1948.

TOSONI, A.L., and IVES, D.A.J. [One-Half to The Governors of the
University of Toronto and One-Half to Astra Pharmaceutical
Products Inc.] 525
Production of High-Activity Fibrinolytic Agents.
U.S. 3,140,984. July 14, 1964.

TOULMIN JR., H.A. [Assignee B] 526
Artificial Sponge and Method of Making It. U.S. 2,731,015.
Jan. 17, 1956.

__________ [Assignee B] 527
Dextran Compound Coated Body Powder. U.S. 2,749,277.
June 5, 1956.

THE UPJOHN CO. 528
Protein Extract (Preparation from Pig Pituitary Glands).
Belgium 663,093. Oct. 27, 1965.*

529
____
Protein Extract (Preparation from Pig Pituitary Glands).
Netherlands (Appln.) 6,505,373. Oct. 27, 1965.*

VEB SERUM-WERK BERNBURG 530
Method for the Production of Fat-Free Ointment Bases.
Austria A8814/61. Published Dec. 15, 1962.*

VERMEHREN, T.L.M. 531
Process for Producing Insulin Preparations With Delayed Effect. Denmark 84,196. Jan. 6, 1958.

——— 532
Process for Producing Cobalt Preparations for Injection. Denmark 84,923. May 27, 1958.

——— 533
Process for Producing Adrenocorticotropic-Hormone Preparation With Delayed Action. Denmark 84,963. June 2, 1958.

——— 534
Process for Producing Compounds That Contain Ether Bonds From Polysaccharides and Amino Alcohols. Denmark 85,906. Oct. 20, 1958.

WELLCOME FOUNDATION LTD. 535
Vaccines and Their Preparation. Belgium 622,212. March 6, 1963.

——— 536
Improved Vaccines. Belgium 636,492. Feb. 24, 1964.

WESTFALL, R.J., and LEWIS, S.H. [Armour Pharmaceutical Co.] 537
Therapeutic Iron-Dextran Preparations. U.S. 3,093,545. June 11, 1963.

WHITE, W.F. (Abbott Laboratories) 538
Purification of Urokinase. U.S. Patent 3,256,158. June 14, 1966.

WIMMER, E.L. [American Sugar Refining Co.] 539
Water-Insoluble Complex of Quaternary Ammonium Salt, a Heavy Metal Oxide, and an Organic Colloid and Method of Preparing Same. U.S. 2,853,414. Sept. 23, 1958.

WITT, E.E. [Assignee B] 540
Production and Recovery of Benzyl Dextran.
U.S. 3,196,146. July 20, 1965.

YAMADA, Y., and ABE, M. [Fermentation Research Institute Inc.] 541
Dextran-Iron. Japan 17,847('61). Sept. 29, 1959.
(Chem. Abstr. 56:14745b. 1962.)

Cross References: 85-95, 105-109, 118, 119, 130-137, 147, 148, 164, 165, 187-215, 262, 644.

IX. PRODUCTION AND INDUSTRIAL USES OF DEXTRAN DERIVATIVES

AKTIEBOLAGET PHARMACIA 542
Process for Manufacturing Gel Products From Materials
Comprising Dextran. Italy 605,659. June 10, 1960.

__________ 543
Process for the Production of Hydrophilic Products of
High Molecular Weight From Dextran. Germany (Appln.) 1922/59.
July 15, 1960.*

__________ 544
Process for the Manufacture of Hydrophilic High Molecular
Weight Substances From Dextran Substances. Britain 854,715.
Nov. 23, 1960.

__________ 545
Preparation of Substituted High Molecular Weight Products.
Britain 936,039. Sept. 4, 1963.*

__________ 546
Method for the Manufacture of High Molecular Weight
Hydrophilic Copolymers of Hydroxyl Group-Containing
Uncharged Polymer Substances in Gel Grain Form.
Britain 974,054. Nov. 4, 1964.

__________ 547
Improvements in or Relating to Ion-Exchange Materials.
Britain 1,013,585. Dec. 15, 1965.

BEHRENS, U., RINGPFEIL, M., and GABERT, A. 548
Dextran Derivatives. U.S.S.R. 154,215. July 24, 1963.
(Chem. Abstr. 60:4242c. 1964.)

__________ RINGPFEIL, M., and GABERT, A. 549
Organogels From Dextran Derivatives. U.S.S.R. 154,369.
July 24, 1963. (Chem. Abstr. 60:1546h. 1964.)

__________ RINGPFEIL, M., and GABERT, A. [VEB Serum-Werk Bernburg] 550
Process for Production of a Highly Swellable Dextran Derivative.
East Germany 27,389. Feb. 25, 1964.

__________ RINGPFEIL, M., GABERT, A., and WEILAND, R. 551
Process for the Production of Carboxylmethyl Dextran or
Its Salts. East Germany 28,566. May 25, 1964.

__________ RINGPFEIL, M., GABERT, A., and OTTE, ERIKA 552
Process for the Swell Proofing and Crease Resistant Finish
of Textiles of Cellulose Fibers Through Formalization.
East Germany 31,814. Oct. 10, 1964.

BERGER, C., and NOVAK, L.J. [Assignee B] 553
Ferrous Carboxymethyl Dextran. U.S. 2,862,920. Dec. 2, 1958.

__________ and NOVAK, L.J. [Assignee B] 554
Ferrous Carboxymethyl Dextran. Canada 623,709. July 11, 1961.

__________ and NOVAK, L.J. [Assignee B] 555
Iron Carboxymethyl Dextran. Britain 891,770. March 21, 1962.

BIKALES, N.M. [American Cyanamid Co.] 556
Cyanoethylated Dextran. Canada 672,893. Oct. 22, 1963.

BISHOP, A.E. [Assignee B] 557
Plasticized Benzyl Dextran and Filament Formed Therefrom.
U.S. 2,789,915. April 23, 1957.

__________ [Assignee B] 558
Fibers and Filaments From Dextran Derivatives.
U.S. 2,914,415. Nov. 24, 1959.

__________ and NOVAK, L.J. [Assignee B] 559
Process for Preparing Dextran Phosphates. U.S. 2,970,141.
Jan. 31, 1961.

BORCHERT, P.J. [Miles Laboratories Inc.] 560
Dialdehyde Polysaccharide-Phenol Derivatives.
U.S. 3,117,105. Jan. 7, 1964.

__________ [Miles Laboratories Inc.] 561
Acetals of Dialdehyde Polysaccharides. U.S. 3,242,161.
March 22, 1966.

__________ KASER, W.L., and MIRZA, J. [Miles Laboratories Inc.] 562
Cellulosic Product of Improved Strength and Process Therefor.
U.S. 3,269,852. Aug. 30, 1966.

BRIDGEFORD, D.J. [Tee-Pak, Inc.] 563
Decausticization of Polysaccharide Xanthates.
U.S. 3,291,789. Dec. 13, 1966.

BULLOFF, J.J. [Assignee B] 564
Production of Chromic Acetylacetonate. U.S. 2,823,217.
Feb. 11, 1958.

THE CENTRAL PHARMACAL CO. 565
Stable Dextran Substitution Products. France 1,413,856.
Oct. 15, 1965.*

CHEMICALS INC. 566
Iron-Dextran Complexes. Britain 1,019,513. Feb. 9, 1966.

CLARKSON, A.H. [Assignee B] 567
A Method of Preparing a Gel Using a Carboxymethyl Dextran.
Britain 876,927. Sept. 6, 1961.

__________ [Assignee B] 568
Higher Fatty Acid Esters of Dextran. Britain 885,516.
Dec. 28, 1961.

COMMONWEALTH ENGINEERING CO. OF OHIO 569
Dextran Filament Manufacture. South Africa 21,831.
March 21, 1955.

__________ 570
Anticorrosive Composition. Belgium 547,848. Aug. 31, 1956.

__________ 571
Nitrates of Dextranic Acid. Belgium 577,903. Aug. 16, 1959.*

CURTIS, J.H. [Miles Laboratories Inc.] 572
Reaction Product of a Dialdehyde Polysaccharide With a
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U.S. 3,236,721. Feb. 22, 1966.

__________ [Miles Laboratories Inc.] 573
Water-Dispersible Form of Dialdehyde Polysaccharides and
Process Therefor. U.S. 3,236,792. Feb. 22, 1966.

__________ [Miles Laboratories Inc.] 574
Water Dispersible Form of Dialdehyde Polysaccharides and
Process Therefor. U.S. 3,269,964. Aug. 30, 1966.

DENISTON, G.L. [Assignee B] 575
Dextran Filament Manufacture. U.S. 2,674,517.
April 6, 1954.

__________ [Assignee B] 576
Dextran Filament Manufacture. U.S. 2,702,231. Feb. 15, 1955.

__________ [Assignee B] 577
Chemically Resistant Cotton Materials. U.S. 2,731,369.
Jan. 17, 1956.

__________ [Assignee B] 578
Adhesive Cotton Article and Method of Making Same.
U.S. 2,746,880. May 22, 1956.

__________ [Assignee B] 579
Dextran Filament Manufacture. Canada 536,397. Jan. 29, 1957.

__________ [Assignee B] 580
Process for Finishing Cotton Fibers, Yarn and Materials
With Dextran Derivatives. Germany 1,051,238. Aug. 13, 1959.

__________ [Assignee B] 581
Manufacture of a Stable Fiber Containing a Dextran Ether
as a Basic Component. Mexico 60,766. Aug. 28, 1959.

FLODIN, P.G.M., and PORATH, J. [Aktiebolaget Pharmacia] 582
Process for Separating Materials Having Different Molecular
Weights and Dimensions. U.S. 3,002,823. Oct. 3, 1961.

__________ and INGELMAN, B.G.A. [Aktiebolaget Pharmacia] 583
Process for Producing Dextran Derivatives and Products
Resulting Therefrom. U.S. 3,042,667. July 3, 1962.

__________ [Aktiebolaget Pharmacia] 584
Process for Preparing Hydrophilic Copolymerization
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__________ JOHANSSON, J.A.O., and CARLSSON, S.Å.I.
[Aktiebolaget Pharmacia] 585
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U.S. 3,275,576. Sept. 27, 1966.

__________ JOHANSSON, J.A.O., and CARLSSON, S.Å.I.
[Aktiebolaget Pharmacia] 586
Anion-Exchanger from Crosslinked Polyhydroxy Materials.
U.S. 3,277,025. Oct. 4, 1966.

FLORAMO, N. [Chemicals Inc.] 587
Cupric Hydrogenated Dextran and Method for Preparing the Same.
U.S. 3,197,458. July 27, 1965.

FOOTE JR., E.H. [Assignee B] 588
Dextran Formals. U.S. 2,893,987. July 7, 1959.

GABERT, A., and VOIGT, B. 589
Macromolecular Chelate-Forming Compounds.
East Germany 44,124. Dec. 23, 1965. (Chem. Abstr.
64:19901c. 1966.)

GAERTNER, V.R. [Monsanto Chemical Co.] 590
Sugar Ethers. U.S. 3,048,577. Aug. 7, 1962.

GAVER, K.M. [The Ohio State University Research Foundation] 591
Uniformly 2-Substituted Glycopyranose Polymers.
U.S. 2,518,135. Aug. 8, 1950.

__________ LASURE, ESTHER P., and THOMAS, L.M. [Keever Starch Co.] 592
Uniformly Substituted Esters of Glycopyranose Polymers.
U.S. 2,538,903. Jan. 23, 1951.

__________ LASURE, ESTHER P., and THOMAS, L.M. [Keever Starch Co.] 593
Reactions of Glycopyranose Polymers With Substituted Ammonium Hydroxides. U.S. 2,563,526. Aug. 7, 1951.

GEVAERT PHOTO-PRODUCTEN N.V. 594
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HILER, M.J. [Assignee B] 595
Rustproofing Compositions. U.S. 2,756,156. July 24, 1956.

__________ [Assignee B] 596
Corrosion Inhibiting Compositions Containing Hydrocarbon Oil and a Dextran Ester of a Saturated Fatty Acid. Canada 557,273. May 13, 1958.

__________ [Assignee B] 597
Detergent-Soil Suspending Composition Containing Carboxymethyl Dextran. U.S. 2,847,385. Aug. 12, 1958.

__________ [Assignee B] 598
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INGELMAN, B.G.A., and FLODIN, P.G.M. [Aktiebolaget Pharmacia] 599
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ISBELL, H.S. [The United States of America as Represented by the Secretary of Commerce] 600
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JEANES, ALLENE R., and WILHAM, C.A. [Assignee A] 601
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KEEN, J.L., WARD, W.J., SWANSON, R.R., and DUNNING, H.N. [General Mills Inc.] 602
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LEMMERLING, J.T. [Gevaert Photo-Producten N.V.] 603
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LINN, C.B. [Universal Oil Products Co.] 604
Condensation of Aromatic Carboxylic Acids With Carbohydrates and Related Materials. U.S. 2,926,174. Feb. 23, 1960.

__________ [Universal Oil Products Co.] 605
Condensation of Nitroaromatic Compounds With Carbohydrates and Related Materials. U.S. 2,926,175. Feb. 23, 1960.

__________ [Universal Oil Products Co.] 606
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__________ [Universal Oil Products Co.] 607
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__________ [Universal Oil Products Co.] 608
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__________ [Universal Oil Products Co.] 609
Condensation of Aromatic Aldehydes With Carbohydrates and Related Materials. U.S. 2,926,179. Feb. 23, 1960.

__________ [Universal Oil Products Co.] 610
Condensation of Aromatic Ketones With Carbohydrates and Related Materials. U.S. 2,926,180. Feb. 23, 1960.

LUACES, E.L. [New Wrinkle Inc.] 611
Wrinkle Drying Composition Containing Dextran Benzyl Ether.
U.S. 2,490,070. Dec. 6, 1949.

__________ [New Wrinkle Inc.] 612
Dextran Base Wrinkle Drying Compositions. U.S. 2,503,622.
April 11, 1950.

__________ [New Wrinkle Inc.] 613
Dextran Base Wrinkle Drying Compositions. U.S. 2,503,623.
April 11, 1950.

__________ [New Wrinkle Inc.] 614
Dextran Base Wrinkle Drying Compositions. U.S. 2,503,624.
April 11, 1950.

MARTIN, T.L. 615
A Process for the Preparation of Compounds of Polysaccharides
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Denmark (Appln.) 4187/55. March 24, 1958.*

McNEELY, W.H., and LOWE, O.G. [Kelco Co.] 616
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Dextran Derivatives. Japan 16,676/65. July 30, 1965.
(Chem. Abstr. 65:5644b. 1966.)

MILES LABORATORIES INC. 618
Dialdehyde Polysaccharide-Phenol Derivatives. Britain 932,657.
July 31, 1963.

__________ 619
Coating Composition and Process. Britain 1,000,888.
Aug. 11, 1965.

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__________ [Assignee B] 622
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__________ [Assignee B] 624
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__________ and WITT, E.E. [Midland Chemical Corp.] 625
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__________ and BISHOP, A.E. [Assignee B] 627
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__________ and BULLOFF, J.J. [Assignee B] 628
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__________ [Assignee B] 629
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U.S. 2,823,188. Feb. 11, 1958.

__________ [Assignee B] 630
Twist-Set Yarns and Method of Preparing. Britain 802,332.
Oct. 1, 1958.

__________ and BULLOFF, J.J. [Assignee B] 631
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__________ and WENZELBERGER, E.P. [Midland Chemical Corp.] 632
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Oct. 14, 1958.

__________ and TYREE, J.T. [Assignee B] 633
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Britain 810,565. March 18, 1959.*

__________ and BISHOP, A.E. [Assignee B] 634
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__________ [Assignee B] 635
Resins Comprising Polyesters Modified by Dextran and
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May 5, 1959.

__________ [Assignee B] 636
Sulfuric Acid Esters of Dextranic Acid. U.S. 2,897,193.
July 28, 1959.

__________ [Assignee B] 637
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U.S. 2,897,194. July 28, 1959.

__________ [Assignee B] 638
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__________ and TYREE, J.T. [Assignee B] 639
Moisture Proof Pellicles and Method of Making. Canada 590,338. Jan. 5, 1960.

__________ [Midland Chemical Corp.] 640
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__________ [Assignee B] 641
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__________ [Assignee B] 642
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__________ [Assignee B] 643
Method of Preparing Pigmented-Dextran Modified Polyesters. U.S. 2,954,351. Sept. 27, 1960.

__________ and TYREE, J.T. 644
Higher Fatty Acid Esters of Dextran. U.S. 2,954,372. Sept. 27, 1960.

__________ [Assignee B] 645
Resins Comprising Polyesters Modified by Dextran and a Monoethylenically Unsaturated Monomer. Britain 852,308. Oct. 26, 1960.

__________ [Midland Chemical Corp.] 646
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__________ and BULLOFF, J.J. [Assignee B] 647
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__________ [Midland Chemical Corp.] 648
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__________ and BULLOFF, J.J. [Assignee B] 649
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__________ [Assignee B] 650
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__________ [Assignee B] 651
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__________ [Assignee B] 652
Antistatic Material and Method of Application. U.S. 2,990,299. June 27, 1961.

__________ [Assignee B] 653
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__________ [Assignee B] 654
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__________ and WITT, E.E. [Midland Chemical Corp.] 655
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__________ and TYREE, J.T. [Assignee B] 656
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Nov. 16, 1961.

__________ [Assignee B] 657
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Germany 1,106,659. Nov. 30, 1961.

__________ [Assignee B] 658
Nitrates of Dextranic Acid. Britain 910,922. Nov. 21, 1962.

__________ [Assignee B] 659
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__________ [Assignee B] 660
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Aug. 3, 1965.*

OWEN, W.L. 661
Aldehyde Reaction Products. U.S. 2,602,082. July 1, 1952.

__________ [John U. Barr] 662
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Jan. 13, 1959.

POTTER, W.W. [The Central Pharmacal Co.] 663
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Britain 944,186. Dec. 11, 1963.

ROSENBERG, S., and BANDEL, D. [American Machine & Foundry Co.] 664
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U.S. 2,988,455. June 13, 1961.

_________ and BANDEL, D. [American Machine & Foundry Co.] 665
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Canada 674,904. Nov. 26, 1963.*

RUSSELL, C.R., BUCHANAN, R.A., and RIST C.E. [Assignee A] 666
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Dec. 8, 1964.

SLAGER, J.E. [Miles Laboratories Inc.] 667
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U.S. 3,086,969. April 23, 1963.

STAHLY, G.L., and CARLSON, W.W. 668
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_________ and CARLSON, W.W. 669
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Jan. 29, 1940.

_________ and CARLSON, W.W. 670
A Method of Producing Soluble Benzyl Ether of Dextran.
Britain 517,820. Feb. 9, 1940.

_________ and CARLSON, W.W. [Commonwealth Engineering Corp.] 671
Method of Making Ether and Ester Derivatives of Polysaccharides
Synthesized Through Bacterial Action. U.S. 2,203,702.
June 11, 1940.

_________ and CARLSON, W.W. [Commonwealth Engineering Corp.] 672
Ethers of Dextran. U.S. 2,203,703. June 11, 1940.

_________ and CARLSON, W.W. [Commonwealth Engineering Corp.] 673
Chemical Method of Etherifying Dextran. U.S. 2,203,704.
June 11, 1940.

__________ and CARLSON, W.W. [Commonwealth Engineering Corp.] 674
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__________ and CARLSON, W.W. [Commonwealth Engineering Corp.] 675
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__________ and CARLSON, W.W. [Commonwealth Engineering Corp.] 676
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__________ and CARLSON, W.W. [Commonwealth Engineering Corp.] 677
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__________ and CARLSON, W.W. [Commonwealth Engineering Corp.] 678
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Feb. 18, 1941.

__________ and CARLSON, W.W. [Commonwealth Engineering Corp.] 679
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U.S. 2,236,386. March 25, 1941.

__________ and CARLSON, W.W. [Commonwealth Engineering Corp.] 680
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__________ and CARLSON, W.W. [Commonwealth Engineering Corp.] 681
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__________ and CARLSON, W.W. [Assignee B] 682
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__________ and CARLSON, W.W. [Chemical Developments Corp.] 683
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__________ and CARLSON, W.W. [Chemical Developments Corp.] 684
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__________ and CARLSON, W.W. [Chemical Developments Corp.] 685
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__________ and CARLSON, W.W. [Chemical Developments Corp.] 686
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TOULMIN JR., H.A. [Assignee B] 687
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Jan. 31, 1956.

__________ [Assignee B] 688
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__________ [Assignee B] 689
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Sept. 11, 1956.

__________ [Assignee B] 690
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__________ [Assignee B] 691
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__________ [Assignee B] 692
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July 14, 1959.

__________ [Assignee B] 693
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__________ [Assignee B] 694
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__________ [Assignee B] 695
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__________ [Assignee B] 696
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__________ [Assignee B] 697
Compositions Comprising Normally Water-Insoluble Dyestuffs and Dextran. Canada 605,575. Feb. 3, 1958.

__________ [Assignee B] 698
Low Water Loss Cement Slurries Comprising Carboxymethyl Dextran and Salts Thereof. Canada 610,695. Dec. 13, 1960.

VEB FOTOCHEMISCHE WERKE BERLIN 699
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WALDIE, W.A., and BERSUDER, J.E. [Chemical Developments Corp.] 700
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__________ and BERSUDER, J.E. [Chemical Developments Corp.] 701
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WEAVER, MARY O., and RUSSELL, C.R. [Assignee A] 702
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WENZELBERGER, E.P. [Assignee B] 703
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__________ [Assignee B] 704
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__________ [Assignee B] 705
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__________ [Midland Chemical Corp.] 706
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__________ [Assignee B] 707
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__________ [Assignee B] 708
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